DIGITAL INTEGRATED AMPLIFIER

KA-3300D

SERVICE MANUAL

KENWOOD

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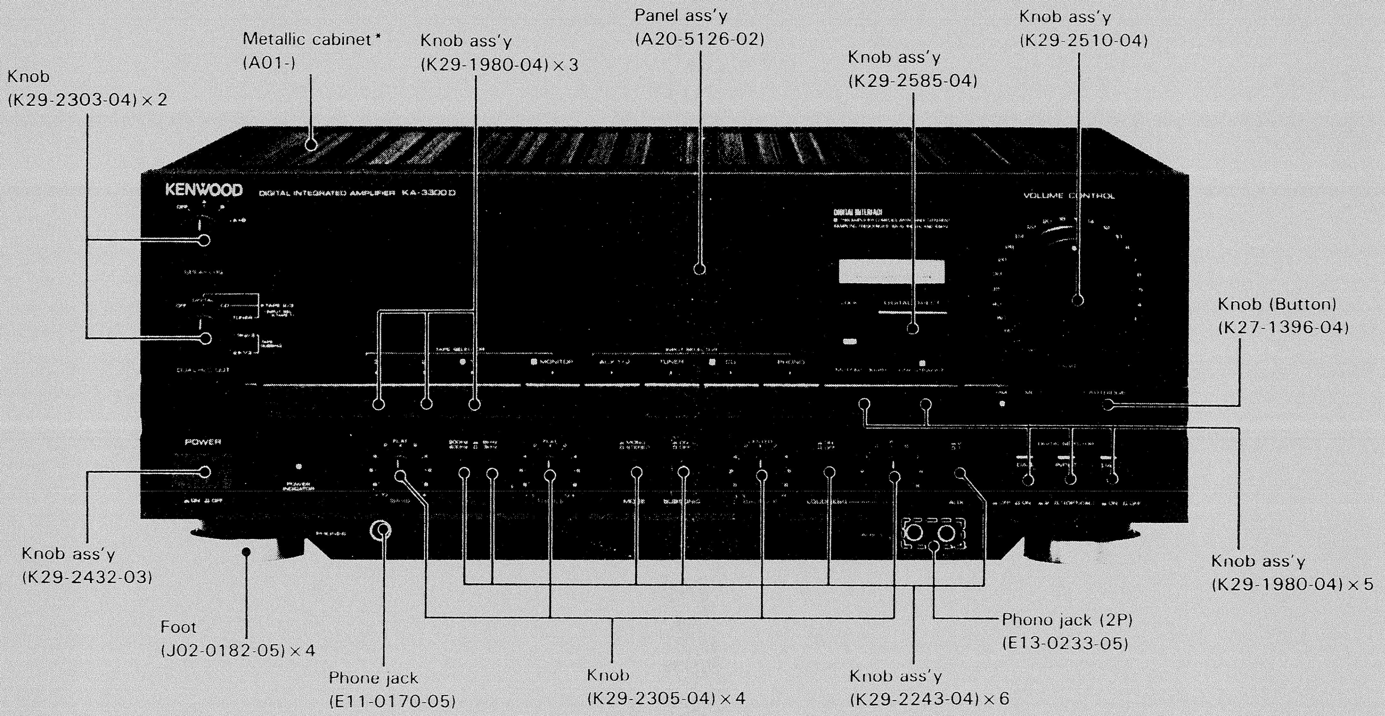
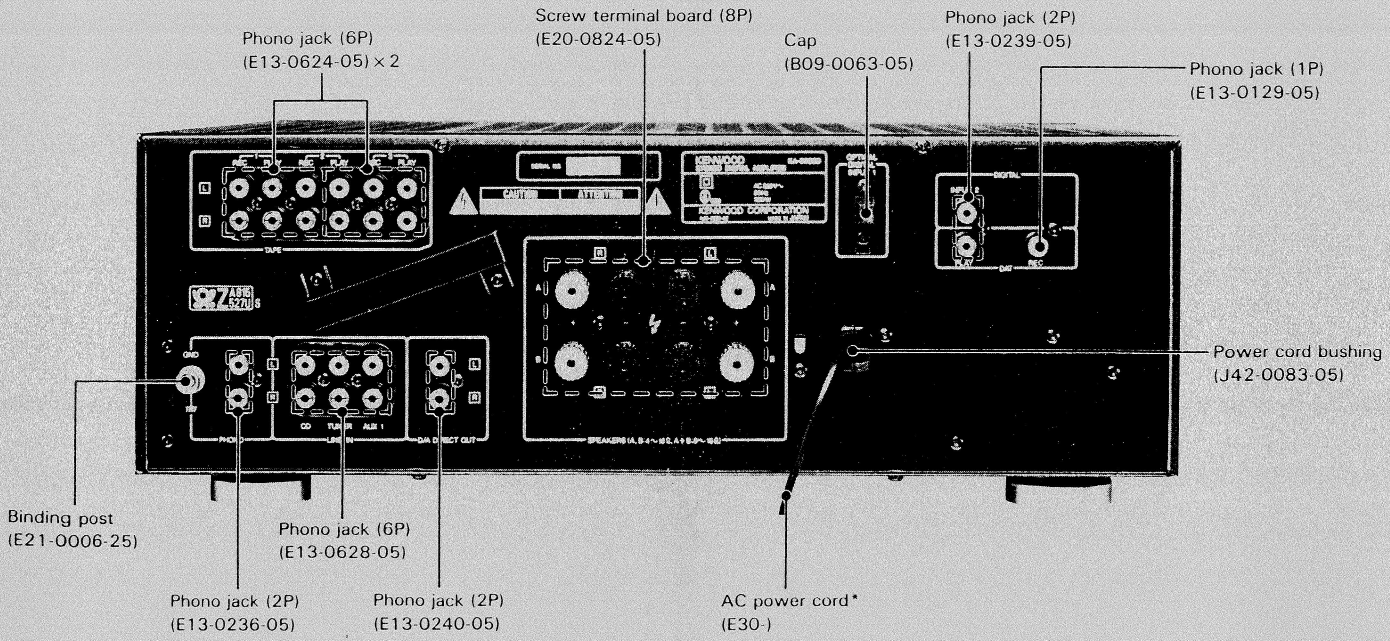
B51-3150-00(T)2347


Metallic cabinet* (A01-)
Knob ass'y (K29-1980-04) × 3
Panel ass'y (A20-5126-02)
Knob ass'y (K29-2510-04)
Knob ass'y (K29-2585-04)
Knob (K29-2303-04) × 2
Knob (Button) (K27-1396-04)
Knob ass'y (K29-2432-03)
Knob ass'y (K29-1980-04) × 5
Foot (J02-0182-05) × 4
Phono jack (2P) (E13-0233-05)
Phone jack (E11-0170-05)
Knob (K29-2305-04) × 4
Knob ass'y (K29-2243-04) × 6


Screw terminal board (8P) (E20-0824-05)
Phono jack (6P) (E13-0624-05) × 2
Cap (B09-0063-05)
Phono jack (2P) (E13-0239-05)
Phono jack (1P) (E13-0129-05)
Power cord bushing (J42-0083-05)
Binding post (E21-0006-25)
Phono jack (6P) (E13-0628-05)
Phono jack (2P) (E13-0236-05)
Phono jack (2P) (E13-0240-05)
AC power cord* (E30-)

Malfunction with the KA-3300D digital circuitry, such as the absence of output, could be due to the digital signal input source such as the CD player as well as the KA-3300D. Therefore, when servicing such trouble, be sure to check and repair the source equipment as well as the KA-3300D.

*** Refer to Parts List on page 55.**

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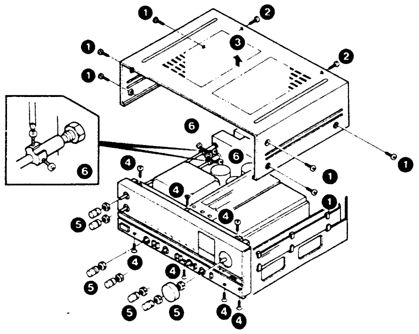
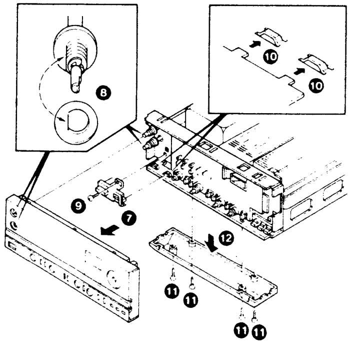
SPECIFICATIONS .... Back cover

DISASSEMBLY FOR REPAIR

1. REMOVING THE FRONT PANEL AND CONTROL UNIT

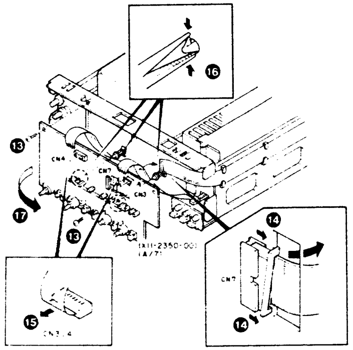
1. Remove the six screws fixing the metallic cabinet to the chassis (left side: 3, right side: 3) (❶).
2. Remove the two screws attached to the metallic cabinet (❷).
3. Remove the metallic cabinet by lifting it in the direction of the arrow (❸).
4. Remove the seven screws attached to the front panel (❹).
5. Remove the seven knobs from the front panel. Also remove the seven nuts taking care not to damage the front panel (❺).
6. Loosen the four screws insert into the two couplings (No.19 in the enlarged diagram) (❻).
7. Remove the front panel in the direction of the arrow (❼).
8. When attaching the front panel again, align the grooves the front panel with those of the extension shaft. If this has not been done, the panel cannot be attached correctly (❽).
9. Remove the screw from the metal part in the power switch section (❾).
10. When attaching the power switch section again, insert the guide pins of the metal part (two on each part) into the slots on the frame (front) (❿).
11. Remove the four screws attaching the connector cover (⓫).
12. Remove the connector cover in the direction of the arrow (⓬).





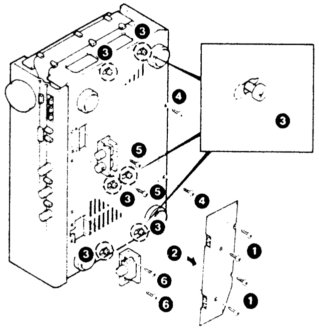
DISASSEMBLY FOR REPAIR

13. Remove the two screws from the Control Unit (X11-2350-81) (A/7) (⓭).
14. Remove the parallel cable which has been connected to CN7 of the Control Unit (X11-) (A/7) in the direction of the arrow (⓮).
15. Remove the parallel cables which have been connected to CN3 and CN4 of the Control Unit (X11-) (A/7) (⓯).
16. Crush the heads of two unit holders which attach the Control Unit (X11-) (A/7) to the frame (front) using radio pliers, and pull them out from the Control Unit (⓰).
17. Remove the Control Unit (X11-) (A/7) in the direction of the arrow (⓱).

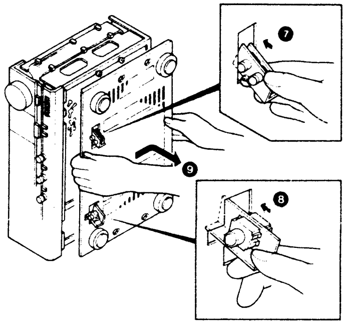


2. REMOVING THE BOTTOM PANEL

1. Remove the four screws from the connector cover (❶).
2. Remove the connector cover in the direction of the arrow (❷).
3. Loosen the six screws on the bottom panel (❸).
4. Remove the two screws from the rear side of the bottom panel (❹).
5. Remove the two screws from the AUX connector section (❺).
6. Remove the two screws from the PHONES jack section (❻).

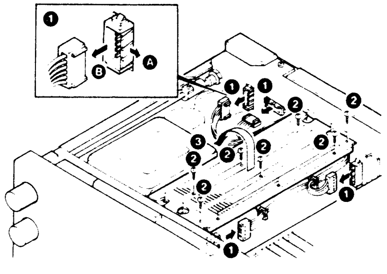


7. Insert the AUX connector section into the slot on the bottom panel (❼).
8. Insert the PHONES jack section into the slot on the bottom panel (❽).
9. Remove the bottom panel from the main chassis in the direction of the arrow (❾).



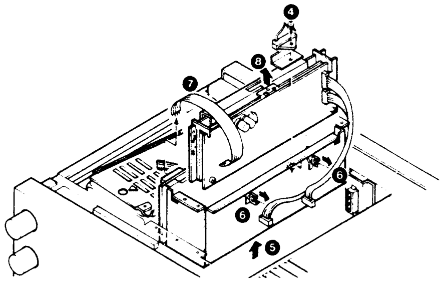
3. REMOVING THE SIGNAL PROCESSOR UNITS AND REAR PANEL

1. Remove the metallic cabinet and bottom panel before performing the following operations.
2. Disconnect the four connectors which have been connected to the frame (rear and front) (❶).
3. Remove the 13 screws retaining the shield cover (❷).
4. Remove the shield cover in the direction of the arrow (❸).

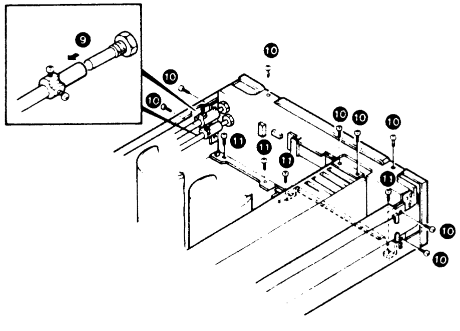


DISASSEMBLY FOR REPAIR

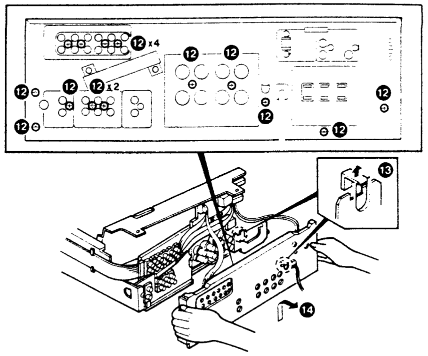
5. Remove the screw retaining the thermal switch, then remove the thermal switch and its metal fixture (❹).
6. Lift the shield case upward (❺).
7. Separate the connector cord from two unit holders attached to the shield case (❻).
8. Disconnect the parallel cable from CN1 of the Signal Processor Unit (X32-1112-71) (C/6) (❼).
9. Lift the two Signal Processor Units (X32-) (A/6, B/6) in the shield case upward.



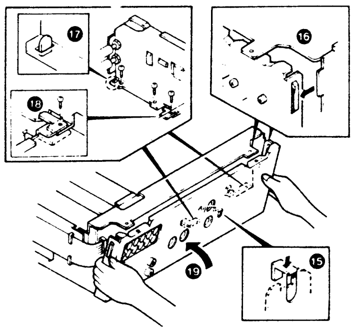
10. Pull out the coupling from the remote switch shaft (❾).
11. Remove the eight screws (four from the upper side, four from the bottom side) from the frame (rear) (❿).
12. Remove the four screws from the bottom side of the frame (rear) (⓫).



13. Remove the 14 screws from the rear panel (⓬).
14. Disengage the claw fixing the rear panel to the chassis (⓭).
15. Remove the rear panel in the direction of the arrow by sliding the left-hand side upward (⓮).

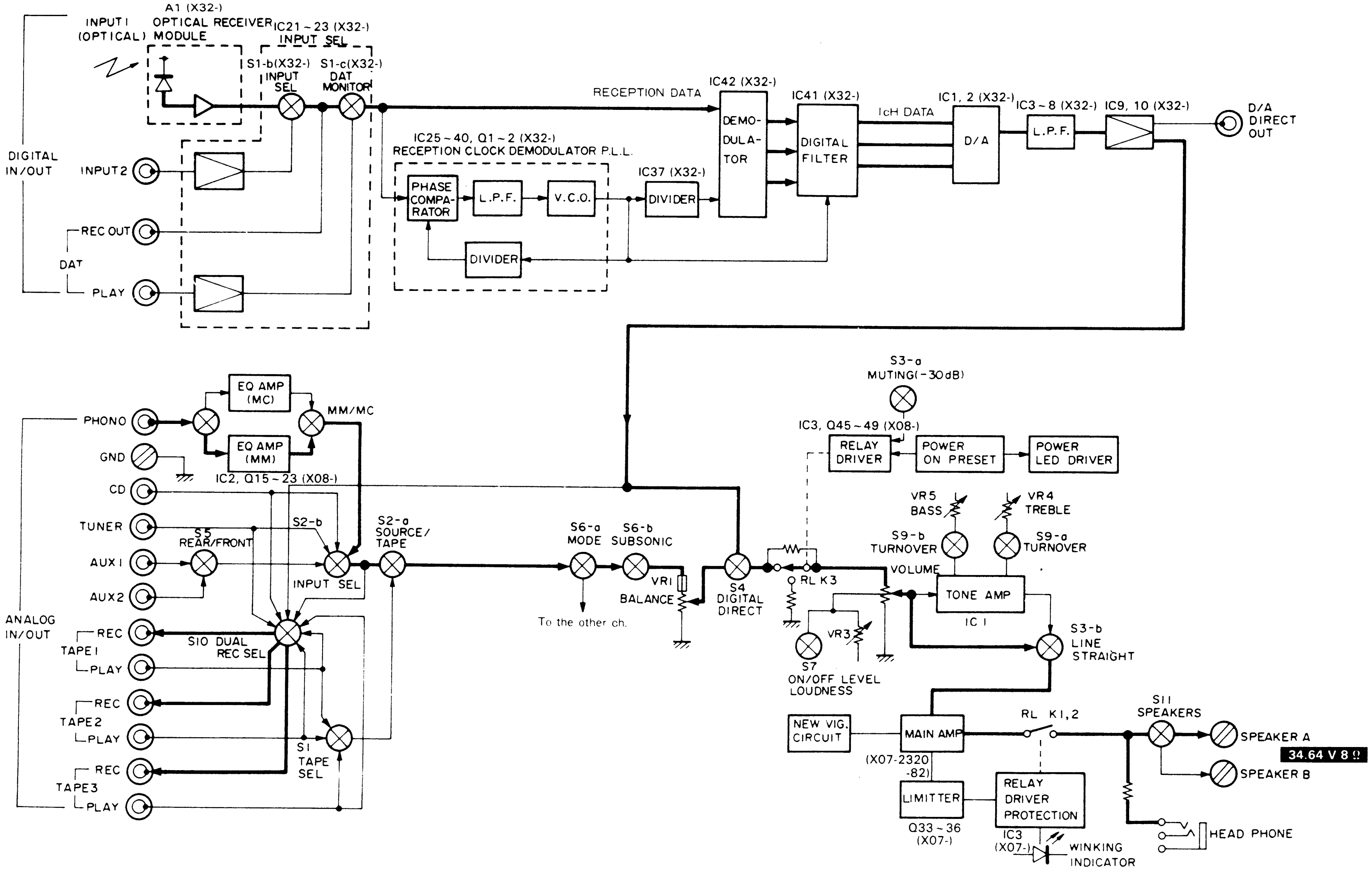


16. When attaching the rear panel, follow the procedure and cautions below.
17. Engage the claw of the rear panel onto the notch on the chassis (⓯).
18. Insert the claw of the frame (left) correctly into the slot on the right side of the rear panel. At this time, the upper surface of the frame (rear) shall come above the rear panel (⓰).
19. Insert the claw of the chassis into the slot on the frame (rear) (⓱).
20. Pile the Main Amplifier unit reinforcement metal (No.736 in the enlarged diagram), frame (rear), Main Amplifier Unit (X07-2320-82) and chassis in this order, and fix them together using a screw (⓲).
21. Attach the rear panel as shown in the diagram (⓳).



BLOCK & LEVEL DIAGRAM

KA-3300D


DIGITAL IN/OUT
INPUT1 (OPTICAL)
A1 (X32-) OPTICAL RECEIVER MODULE
IC21 ~ 23 (X32-) INPUT SEL
S1-b(X32-) INPUT SEL
S1-c(X32-) DAT MONITOR
INPUT2
REC OUT
DAT
PLAY
RECEPTION DATA
IC25 ~ 40, Q1 ~ 2 (X32-) RECEPTION CLOCK DEMODULATOR P.L.L.
PHASE COMPA-RATOR
L.P.F.
V.C.O.
DIVIDER
IC37 (X32-)
DIVIDER
IC42 (X32-)
DEMO-DULA-TOR
IC41 (X32-)
DIGITAL FILTER
IcH DATA
IC1, 2 (X32-)
D/A
IC3 ~ 8 (X32-)
L.P.F.
IC9, 10 (X32-)
D/A DIRECT OUT
ANALOG IN/OUT
PHONO
GND
CD
TUNER
AUX1
AUX2
TAPE1 REC
TAPE1 PLAY
TAPE2 REC
TAPE2 PLAY
TAPE3 REC
TAPE3 PLAY
EQ AMP (MC)
EQ AMP (MM)
MM/MC
IC2, Q15 ~ 23 (X08-)
S5 REAR/FRONT
S2-b
INPUT SEL
S2-a SOURCE/ TAPE
S10 DUAL REC SEL
S1 TAPE SEL
S6-a MODE
S6-b SUBSONIC
To the other ch.
VR1 BALANCE
S4 DIGITAL DIRECT
RL K3
S7 ON/OFF LEVEL LOUDNESS
VR3
S3-a MUTING(-30dB)
IC3, Q45 ~ 49 (X08-)
RELAY DRIVER
POWER ON PRESET
POWER LED DRIVER
VR5 BASS
VR4 TREBLE
S9-b TURNOVER
S9-a TURNOVER
VOLUME
TONE AMP
IC1
S3-b LINE STRAIGHT
NEW VIG. CIRCUIT
MAIN AMP
(X07-2320 -82)
LIMITTER
Q33 ~ 36 (X07-)
RL K1,2
RELAY DRIVER PROTECTION
IC3 (X07-)
WINKING INDICATOR
S11 SPEAKERS
SPEAKER A
34.64 V 8 Ω
SPEAKER B
HEAD PHONE

CIRCUIT DESCRIPTION

DESCRIPTION OF COMPONENTS

Main Amplifier Unit (X07-2320-82)

Component	Use/Function	Operation/Condition/Compatibility
Q1 ~ 4	Predriver	
Q5 ~ 8	Predriver	
Q9 ~ 20	Cascode bootstrap circuit	Transistors forming the VIG circuit. Q9, 10, 13 and 14 form the constant-voltage circuit, Q11, 12, 15 and 16 the buffer, and Q17 to 20 are grounded-base circuit for cascode grounding.
Q21, 22	Bias circuit	For temperature compensation of final transistors.
Q23, 24	Constant-voltage circuit	Constant-voltage regulator circuit for the main A Class 1st-stage differential amp, provided to improve the CMRR and SUR.
Q25 ~ 28	High-side power transistors	Final transistors for high-power output.
Q29 ~ 32	Low-side power transistors	Final transistors for low-power output.
Q33 ~ 36	Current limiter	Limits the current to final transistors during over-load driving.
Q51 ~ 54	Constant-voltage circuit	Constant-voltage regulator circuit for the main A Class stage. Q51 and 52 are control transistors, and Q53 and 54 form an error amplifier.
Q55, 56	Protection driver	Ripple removal circuit inserted in the B line for A Class 1st-stage amp.
Q57	Constant-voltage circuit	Used to transmit the operation signal of current limiter Q33 and Q34 to the protection IC (IC3).
Q58	Constant-voltage circuit	Constant-voltage regulated circuit for the muting relay and tact SW driver circuitry.
Q59 ~ 62	Constant-voltage circuit	Constant-voltage regulated circuit for the equalizer amp. Q59 and 60 are control transistors, and Q61 and 62 form an error amplifier.
IC1, 2	DLD switching IC	DLD High/Low switching circuit.
IC3	Protection IC	Performs muting when power is turned ON/OFF, and output relay control in case of DC leakage to SP pin overload, etc.

Preamplifier Unit (X08-2180-82)

Component	Use/Function	Operation/Condition/Compatibility
Q1 ~ 4	EQ MC 1st-stage differential amp	
Q5 ~ 8	EQ 1st-stage cascode circuit	
Q9, 10, 23, 24	EQ constant-voltage circuit	Provided to improve the SVRR and CMRR of 1st-stage differential amp.
Q11 ~ 14	EQ MC output-stage emitter-follower circuit	
Q15 ~ 18	EQ MM 1st-stage differential amp	
Q19 ~ 22	EQ MM output-stage emitter-follower circuit	
Q25, 26	A Class 1st-stage differential amp	
Q27 ~ 30	A Class 1st-stage cascode circuit	
Q31 ~ 34	A Class 2nd-stage differential amp	
Q35 ~ 38	A Class 3rd-stage differential amp	
Q39 ~ 42	A Class cascode circuit	
Q43, 44	A Class current Miller circuit	
Q45 ~ 49	Muting control and driver circuit	Control and drive of the muting lamp and relays.
IC1, 2	EQ op amp IC	
IC3	Muting circuit IC	J-K flip-flop.

CIRCUIT DESCRIPTION

Signal Processor Unit (X32-1112-71)

Component	Use/Function	Operation/Condition/Compatibility
Q1, 2	Switching transistors	Used for switching time constant of IC26 (one-shot multivibrator).
Q3	PLL filter amp	Amplifier for PLL loop filter (active filter).
Q4	LED driver	LOCK display LED driver.
Q5	Muting driver	Driver of muting relay.
Q6	Deemphasis driver	Driver of deemphasis switching relay.
Q7, 8	Constant-voltage circuit	
IC1, 2	D/A converter	16-bit D/A converter.
IC3 ~ 8	General-purpose op amp	ICs for L.P.F.
IC9, 10	General-purpose op amp	Line amplifier.
IC21	General-purpose inverter	
IC22, 23	NAND gate IC	
IC24	General-purpose inverter	
IC25	Exclusive OR gate	
IC26, 35	Monostable multivibrator	
IC27	PLL phase comparator	
IC28	V.C.O.	
IC29	D-type flip-flop	
IC30, 38	Digital counter IC	
IC31, 33	JK-type flip-flop	
IC32	Exclusive OR gate	
IC34, 43	TR switch stabilizer circuit	
IC36	NOR gate IC	
IC37	Oscillator IC	
IC39	NAND gate IC	
IC40, 44	General-purpose inverter	
IC41	Quadruple oversampling digital filter	
IC42	Data receiver-demodulator	
IC45, 46	3-pin regulator	Constant-voltage ±5 V regulated power supply for DAC analog line.
IC47, 48	3-pin regulator	Constant-voltage ±5 V regulated power supply V for digital line.
IC49	General-purpose op amp	Error amplifier for ±12 V regulated power supply for analog line.
D1		DAC ON/OFF display LED.
D2		DIGITAL INPUT 1/2 display LED.
D3		DAT MONITOR display LED.
D4 ~ 11		For protection against static electricity.
D12, 36		Form an AND circuit with R93.
D13		For discharging C96.
D14		Interchangeable with ISS97.
D15, 16		Form and AND circuit with R118.
D17		For holding charge of C100.
D18		For discharging C129.
D19		For discharging C130.
D20, 21		Form and AND circuit with R125.
D22, 23		For absorption of relay's counterelectromotive force.
D24		Constant-current diode.
D25		For generating reference voltage of constant-voltage regulated power supply.

CIRCUIT DESCRIPTION

Component	Use/Function	Operation/Condition/Compatibility
D26		Constant-voltage regulated power supply (FAST OFF).
D27~35		For current shaping.
D37~43		For protection against static electricity.
A1	Optical reception module	Converts optical signal into electric signal.

Control Unit (X11-2350-81)

Component	Use/Function	Operation/Condition/Compatibility
Q1	LED drive switching circuit	
Q2, 3	Blinking circuit	The LED lights continuously while the power indicator and set are operating normally. It blinks during the period between power ON and amplifier stabilization (for approx. 5 sec.) or when the protection circuit is activated due to a malfunction in the power amplifier.
Q4	Constant-voltage circuit for lamp	Controls the voltage applied to the lamp to 27 V.
IC1	Tone control circuit IC	

CIRCUIT DESCRIPTION

1. NEW VIG DLD CIRCUIT

1-1. Features

The KA-3300D is not only an upgraded unit of KA-1100D, but a variable superb integrated amplifier incorporated with digital technology.

KA-3300D incorporates new technology appropriate for an up-market integrated amplifier, such as:

1. A new VIG DLD (Dynamic Linear Drive) circuit
2. A dual phono equalizer
3. A dual REC OUT switch

1-2. A New VIG DLD Circuit

Refer to the KA-990V new-product data for an explanation of the principle on which VIG operates.

The configuration of the VIG circuit incorporated in the current KA-990V is depicted in Fig. 1.

In addition to preventing the influx of undesirable power source components (such as ripples) into the Q1 driver transistor, the VIG circuit also applies a bootstrap to the output as shown in Fig. 1 Ⓐ. The output from the VIG then follows the output from the amplifier in a constant voltage shift pattern. The input signal is no longer absorbed by the power source according to the potential which exists between the input and the power, and high-frequency characteristics and distortion rates are improved.

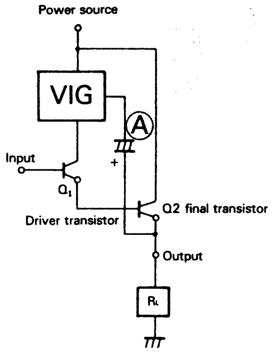


Fig. 1 Configuration of a Conventional VIG Circuit

As a result, the voltage across the output of Q1 (the emitter) and the power source (the collector) is held constant whether or not there is a signal (see Fig. 2).

This insertion of a VIG circuit in the initial stage of a Darlington connection circuit means that undesirable power source components do not undergo current amplification at Q2, the final transistor. In other words, large-capacity power sources free of ripples become the norm.

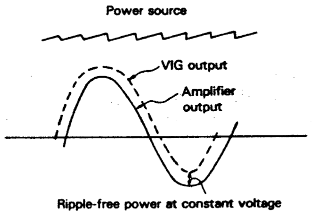


Fig. 2 VIG Output and Amplifier Output

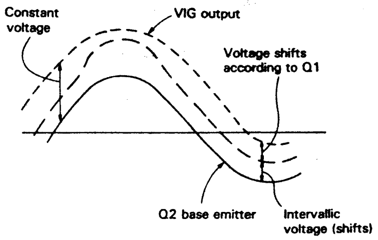


Fig. 3 VB-E and VIG Output

CIRCUIT DESCRIPTION

Upon further investigation, however, doubts arose concerning operation of the Q2 driver transistor at the abovementioned constant voltage. That is, the voltage across the transistor base and emitter could be thought of as normally about 0.6 volts, but the final transistor voltage shifted between 0.6 to about 2.0 volts in keeping with the output current (see Fig. 3). In the conventional configuration depicted in Fig. 1, this shift caused the voltage applied to the driver transistor Q1 to shift as well. It became clear that with the conventional configuration undesirable power source components were suppressed, but this in turn produced new voltage shift components.

The new VIG circuit applies a bootstrap to the Q2 final transistor base as shown in Fig. 4. In addition, a buffer has been inserted so that any undesirable power source components which may leak through the bootstrap do not undergo current amplification at Q2.

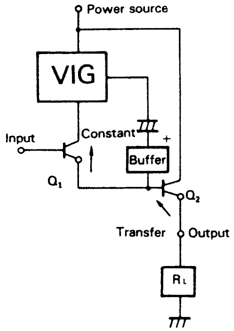

Power source
VIG
Input
Constant
Buffer
Q1
Q2
Transfer
Output
RL

Fig. 4 Configuration of the New VIG Circuit

With this configuration, the new VIG circuit permits capacities to be utilized to the fullest extent.

Undesirable power source components can be suppressed, as can the shift component produced by operation of the circuit itself, for effectiveness 25 times greater than that of conventional circuit configurations. This permits Q1 to operate at an ideal constant voltage and allows only very pure signals to be input to the final transistor, making possible "cleaner" overall amplification.

1-3. Effects of the New VIG Circuit

1. Effects on the amplifier of ripples and signal components caused by the power source, as well as the cross modulation distortion to which they give rise, are drastically reduced for clear, sharp audio.
2. Power can be boosted accordingly (over 10 times conventional levels) for brilliant audio.
3. Improves raw effects at the pre-negative feedback voltage amplification stage for broad band. low-distortion sound.
4. Reduces dynamic crosstalk and other power source-induced interference.

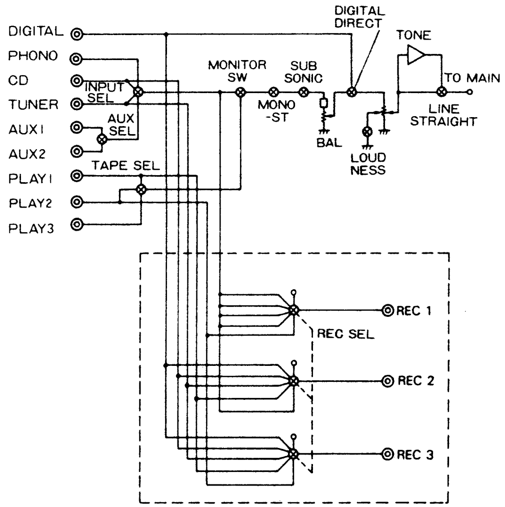
1-4. Dual REC OUT

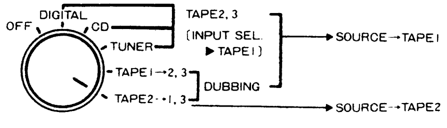
REC 1, 2, 3 output the signals indicated in the chart at right. REC 1 functions as the source selector, while REC functions as the REC selector.

During tape dubbing, the source signal is output at the playback TAPE REC-OUT.

POSITION	REC1	REC2	REC3
OFF	OFF	OFF	OFF
DIGITAL →2, 3	SOURCE	DIGITAL	DIGITAL
CD →2, 3	SOURCE	CD	CD
TUNER →2, 3	SOURCE	TUNER	TUNER
TAPE 1 →2, 3	SOURCE	PLAY 1	PLAY 1
TAPE 2 →1, 3	PLAY2	SOURCE	PLAY 2

Note: Signal selected by the SOURCE INPUT SEL.


DIGITAL
PHONO
CD
TUNER
AUX I
AUX2
PLAY I
PLAY2
PLAY3
INPUT SEL
AUX SEL
TAPE SEL
MONITOR SW
SUB SONIC
MONO -ST
BAL
DIGITAL DIRECT
TONE
LOUD NESS
TO MAIN
LINE STRAIGHT
REC 1
REC SEL
REC 2
REC 3

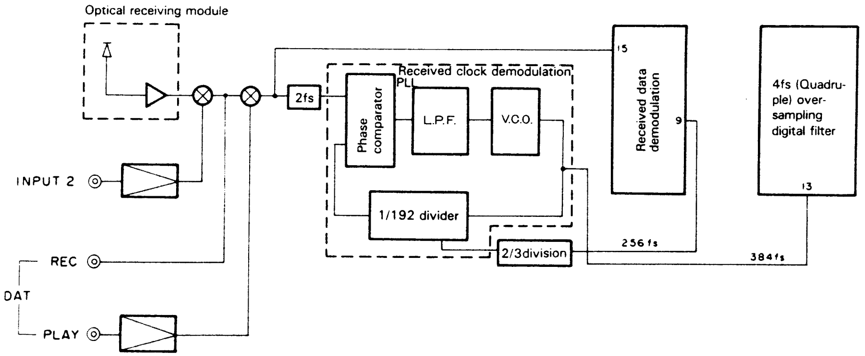

OFF
DIGITAL
CD
TUNER
TAPE I→2, 3
TAPE2→1, 3
TAPE2, 3
(INPUT SEL. ▶TAPE I)
DUBBING
SOURCE→TAPE I
SOURCE→TAPE2

CIRCUIT DESCRIPTION

2. DIGITAL AUDIO INTERFACE

This is a self-synchronization, serial interface designed for connection of digital signals between digital audio equipment (CD player, DAT, etc.).

Block diagram


Optical receiving module
INPUT 2
REC
DAT
PLAY
2fs
Received clock demodulation
PLL
Phase comparator
L.P.F.
V.C.O.
1/192 divider
2/3division
Received data demodulation
15
9
256 fs
4fs (Quadruple) over-sampling digital filter
13
384fs

3. DIGITAL SIGNAL FORMATS

3-1. The sub-frame is the minimum unit of transmitted data. It consists of 32 bits of data obtained by one audio-signal sampling operation. With the CD format the sampling frequency of which is 44.1 kHz, 44,100 data per second are sampled with each of the L and R channels, so that a total of 88,200 data are obtained every second. Each of data obtained in this way corresponds to one sub-frame. (Fig. 1)

3-2. A sub-frame consists of the SYNC part which is a special pattern called preamble, the audio data part, and the control part which includes emphasis data, etc. (Fig. 2)

3-3. The data is transferred after biphase-mark modulation. With this modulation, bits "1" are inverted twice while bits "0" are inverted once. (Fig. 3)

Fig. 1

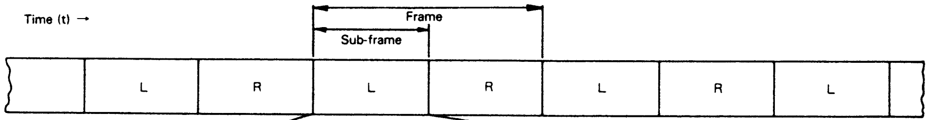

Time (t) →
Frame
Sub-frame
L
R
L
R
L
R
L

Fig. 2

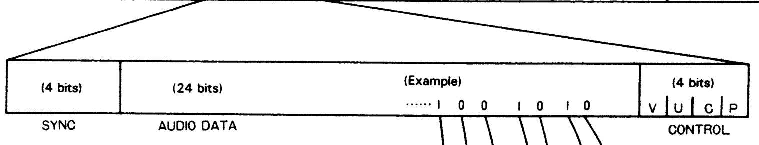
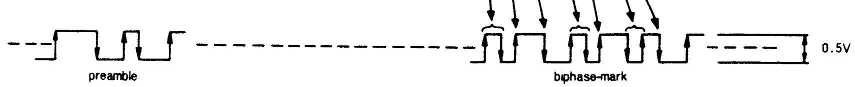

(4 bits)
(24 bits)
(Example)
...... I 0 0 I 0 I 0
(4 bits)
V U C P
SYNC
AUDIO DATA
CONTROL

Fig. 3


0.5V
preamble
biphase-mark

CIRCUIT DESCRIPTION

4. THREE SAMPLING FREQUENCIES AND TRANSMITTED SIGNAL

The digital signal is output at 0.5 Vp-p. The L and R signals are time-division multiplexed so that stereo digital audio data is transmitted via one single cable (optical cable or 75-ohm coaxial cable).

The information required for sound reproduction by the receiving equipment (bit, clock and emphasis data) is also transferred together with the audio data.

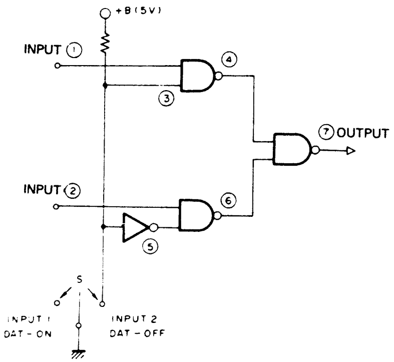
The signal is transmitted at 32 times the sampling frequency, and bits "1" are transmitted at twice the abovementioned transmission frequency. To enable direct connection of the digital signals from the equipment described in 1 (CD player, DAT, BS), the three types of sampling frequencies are prepared defined by the standard.

Sampling Frequency (fs)	Transmission Frequency		Source Equipment of fs
	32×fs with "0"	2×32×fs with "1"	
32 kHz	1.024 MHz	2.048 MHz	DBS, DAT (option)
44.1 kHz	1.4112 MHz	2.8224 MHz	CD, DAT (PCM processor signal)
48 kHz	1.536 MHz	3.072 MHz	DAT (record/play type), DBS

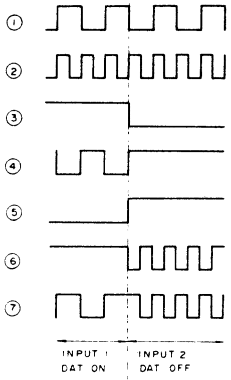
5. INPUT SWITCHING CIRCUIT

Three input systems are switched by purely electronic method.

The X32 (D/6) input switching circuit has the basic configuration as shown below. The contents of its operation is shown in the timing chart below.



X32 (D/6)



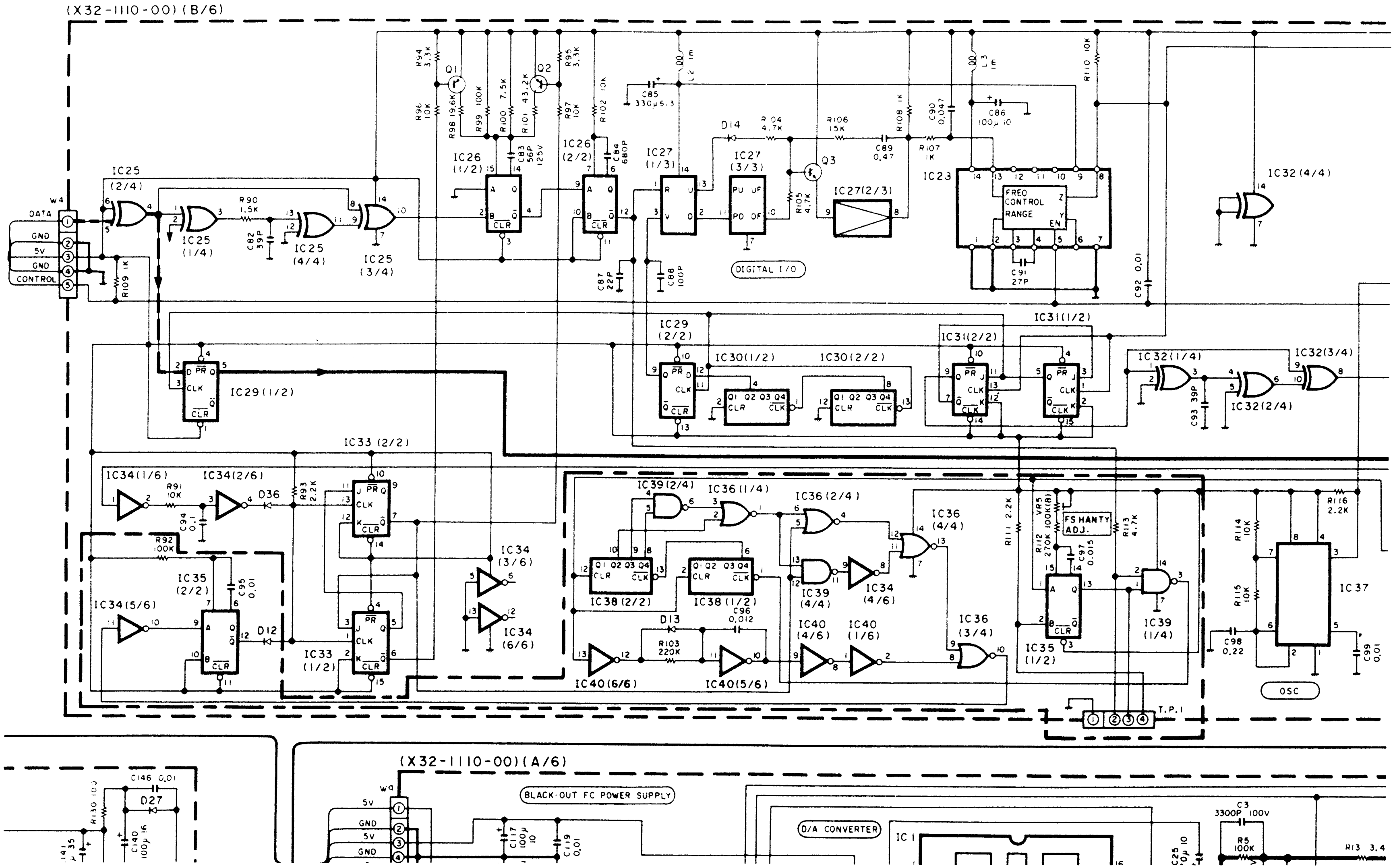
	Pin No. of INPUT 1/2	Pin No. of DAT ON/OFF
①	IC23 ②	IC23 ④
②	IC23 ⑬	IC22 ⑬
③	IC23 ①	IC23 ⑤
④	IC23 ③	IC23 ⑥
⑤	IC24 ②	IC22 ⑫
⑥	IC23 ⑪	IC22 ⑪
⑦	IC23 ⑧	IC22 ③

6. DIGITAL I/O CIRCUIT

The signal is input to received data demodulation IC pin 15. At this stage, the signal contains the clock required for data reproduction in addition to the digital audio data. The clock must first be reproduced because it is used as the basis for demodulating the biphase-modulated signal into ordinary digital data and for converting it into analog signal using the D/A converter. All processing after this stage until the D/A conversion is performed based on the clock.

SAMPLING FREQUENCY (fs) IDENTIFICATION CIRCUIT

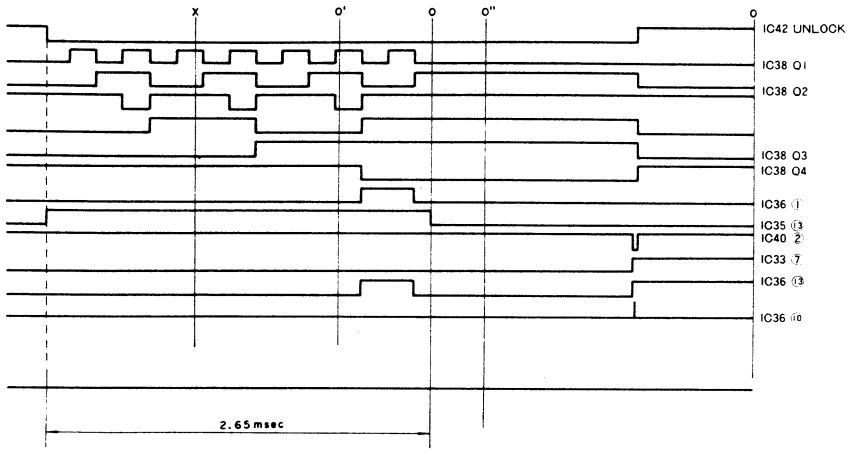
RECEIVED CLOCK DEMODULATION PLL


(X32-1110-00) (B/6)
W4
DATA
GND
5V
GND
CONTROL
R109 1K
IC25 (2/4)
IC25 (1/4)
R90 1.5K
C82 39P
IC25 (4/4)
IC25 (3/4)
R94 3.3K
Q1
R96 10K
R98 19.6K
R99 100K
R100 7.5K
R101 43.2K
Q2
R95 3.3K
R97 10K
C83 56P 125V
IC26 (1/2)
IC26 (2/2)
R102 10K
C84 680P
C87 22P
C88 100P
C85 330μ6.3
L2 1m
IC27 (1/3)
IC27 (3/3)
D14
R104 4.7K
R105 4.7K
Q3
IC27(2/3)
DIGITAL I/O
R106 15K
C89 0.47
R108 1K
R107 1K
C90 0.047
L3 1m
C86 100μ 10
IC23
FREQ CONTROL RANGE
EN
C91 27P
R110 10K
C92 0.01
IC32 (4/4)
IC29 (1/2)
IC29 (2/2)
IC30(1/2)
IC30(2/2)
Q1 Q2 Q3 Q4
CLR
CLK
IC31(2/2)
IC31(1/2)
IC32(1/4)
IC32(2/4)
IC32(3/4)
C93 39P
IC33 (2/2)
IC33 (1/2)
IC34(1/6)
IC34(2/6)
R91 10K
D36
C94 0.1
R93 2.2K
R92 100K
IC35 (2/2)
C95 0.01
IC34(5/6)
D12
IC34 (3/6)
IC34 (6/6)
IC39(2/4)
IC36 (1/4)
IC36 (2/4)
IC36 (4/4)
IC38 (2/2)
IC38 (1/2)
C96 0.012
D13
R103 220K
IC40 (6/6)
IC40(5/6)
IC39 (4/4)
IC34 (4/6)
IC40 (4/6)
IC40 (1/6)
IC36 (3/4)
R111 2.2K
VR5 100K(B)
R112 270K
FS HANTY ADJ.
C97 0.015
R113 4.7K
IC35 (1/2)
IC39 (1/4)
T.P.1
R114 10K
R115 10K
R116 2.2K
C98 0.22
IC37
C99 0.01
OSC
C146 0.01
D27
R130 10
C140 100μ 16
(X32-1110-00) (A/6)
W9
5V
GND
5V
GND
BLACK-OUT FC POWER SUPPLY
C117 100μ 10
C119 0.01
D/A CONVERTER
IC1
C25 10μ 10
C3 3300P 100V
R5 100K
R13 3.4

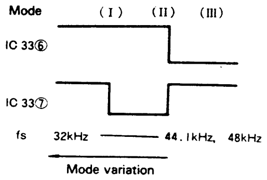
Some circuit boards are equipped with VR5 and 4-pin TP1. However, this adjustment circuit is not used so it is not necessary to adjust VR5. (The parts boxed with "---" are not operating.)

CIRCUIT DESCRIPTION

6-1. Operation of sampling frequency (fs) identification circuit

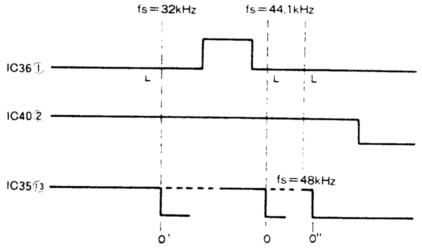


Q1 and Q2 in the circuit diagram are used to switch the window for detection of the SYNC signal. The state at IC33 pins 6 and 7 varies in three modes depending on the output of each Q.



When fs = 32 kHz is input, the PLL is locked in mode (I).
It is locked in mode (III) when fs = 48 kHz.
The mode of IC33 varies via D36 and D12. However, when fs = 32 kHz or 48 kHz, the mode will not be varied by the signal passing through D12. This is because, when fs = 32 kHz or 48 khz, the PLL is locked first only in mode (I) or (III). Next, when fs = 44.1 kHz is input, the locked mode can either be mode (II) or (III) because it is close to fs = 48 kHz. When the PLL is locked in mode (III), the inputs to IC39 pin 12 and IC36 pin 5 go "L" and the output at IC36 pin 1 is output directly at IC36 pin 13. When it is locked in mode (II), the output at IC36 pin 1 is inverted and output at IC36 pin 13.

The signal output at IC36 pin 1 depends on the fs as well as on the time constant across IC35 pins 15 and 14. If the pulse duration is set to 2.65 ms, the output goes "L". This is shown in the timing chart, with IC36 pin 1 output during transition of IC35 pin 13 output from "H" to "L". This diagram shows the case in which fs = 44.1 kHz, but the output is also "L", with the "⌉_" point at the position of 0' when fs = 32 kHz and at the position of "0" when fs = 48 kHz.

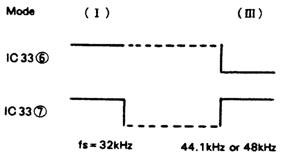


CIRCUIT DESCRIPTION

Assuming that the PLL is locked in mode (II) with fs = 44.1 kHz, IC33 pin 7 is "L" in this mode and IC40 pin 2 goes from "H" to "L" in a certain period of time (approx. 1.35 ms).
At this time, IC36 pin 10 outputs "H" for an instant, and the 3-mode switch of IC33 changes the mode to "HH". The PLL is unlocked at this time as shown in the top of the timing chart. However, the $\overline{\text{DISCHG}}$ signal is input from IC42 to IC33, the mode is changed, and the PLL is locked finally in mode (III).
If the PLL is locked in mode (III) with fs = 44.1 kHz, IC33 pin 7 is "H", and IC36 pin 10 does not generate pulse even when IC40 pin 2 goes "⌉_", so the PLL lock state is maintained.
The "_⎍_" pulse extracted from IC36 pin 1 is used to ensure stable locking even when fs drops around 40 kHz due to the variable-pitch circuit. Under such condition, the "⌉_" (negative-going) edge of the above-mentioned 2.65 ms pulse is generated on the above-mentioned pulse. Even when the mode is (II) at this time, IC36 pin 10 does not output pulse so the locking is stabilized in mode (II).
In short, the additional circuit which incorporates a counter, etc. functions so that the PLL is locked in the following condition:

		IC33	
		pin 6	pin 7
fs = 32 kHz:	Mode (I)	(H	H)
fs = 44.1 kHz:	Mode (III)	(L	H)
fs = 40 kHz:	Mode (II)	(H	L)(Variable-pitch)
	or (III)	(L	H)

In the actual circuit, D12 is eliminated, and shown enclosed in broken lines (---) in the circuit diagram, is not operating. Then the models with Serial No. 73K00000 and after, the parts boxed with "---" are eliminated.
Therefore, the PLL of the IC33 in modes (6) and (7) locks with (I) and (III).



6-2. Received clock demodulator PLL

The output from VCO IC28 pin 6 becomes 384-fs, a part of the signal is divided into 1/192 by IC31 and IC30 to generate a signal which is input to phase-comparator IC27 pin 3. The 2 f of the input signal is also input to IC27 via pin 1, and the PLL is locked when the signals at pins 1 and 3 become identical.

At this PLL, two types of clocks are generated simultaneously; the 384-fs clock required for the processing from the VCO to digital filter; and the 256-fs clock required for data demodulation which is obtained by dividing the 384-fs clock into 2/3.

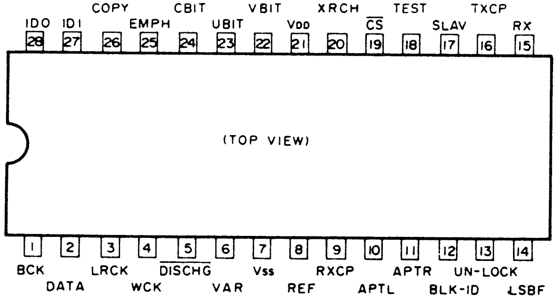
Sampling frequency	256fs	384fs	Major source unit
32 kHz	8.192 MHz	12.288 MHz	DBS
44.1 kHz	11.2896 MHz	16.9344 MHz	CD
48 kHz	12.288 MHz	18.432 MHz	DAT, DBS

6-3. Received data demodulator IC42

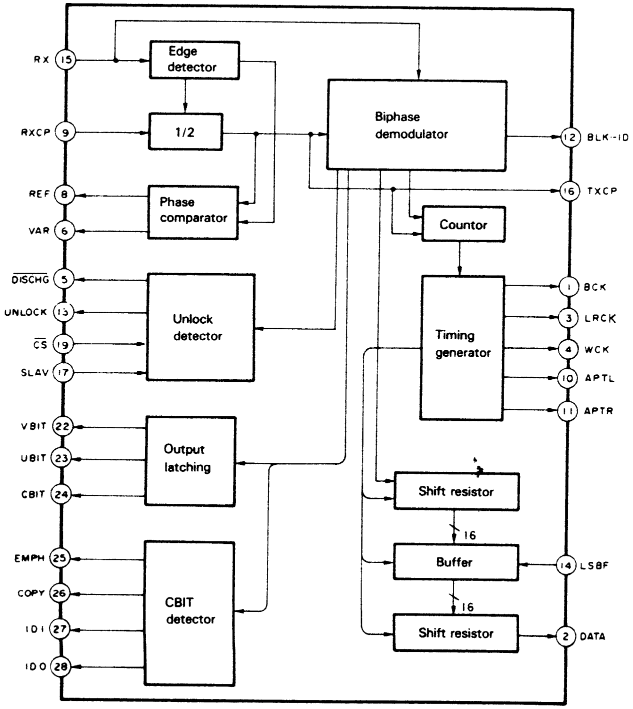
Using the reproduced 256-fs clock, demodulator IC42 demodulates the biphase-modulated audio data to obtain the digital audio data that can be D/A modulated and, at the same time, extracts the information from the subcode, such as the emphasis data.

IC42: CXD1076P Received Data Demodulator

Pin Configuration


IDO
ID1
COPY
EMPH
CBIT
UBIT
VBIT
VDD
XRCH
CS
TEST
SLAV
TXCP
RX
28
27
26
25
24
23
22
21
20
19
18
17
16
15
(TOP VIEW)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
BCK
DATA
LRCK
WCK
DISCHG
VAR
Vss
REF
RXCP
APTL
APTR
BLK-ID
UN-LOCK
LSBF

Block Diagram

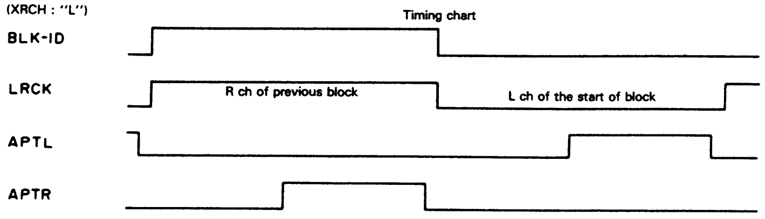

RX 15
RXCP 9
REF 8
VAR 6
DISCHG 5
UNLOCK 13
CS 19
SLAV 17
VBIT 22
UBIT 23
CBIT 24
EMPH 25
COPY 26
ID1 27
ID0 28
Edge detector
1/2
Phase comparator
Unlock detector
Output latching
CBIT detector
Biphase demodulator
Countor
Timing generator
Shift resistor
16
Buffer
16
Shift resistor
12 BLK-ID
16 TXCP
1 BCK
3 LRCK
4 WCK
10 APTL
11 APTR
14 LSBF
2 DATA

Explanation of Pins

Pin No.	I/O	Pin Name	Function
1	O	BCK	Digital audio data shift-clock output.
2	O	DATA	Serial output of demodulated digital audio data.
3	O	LRCK	Outputs the audio data L/R channel-identification pulse. The polarity can be switched by XRCH pin. The R CH is "High" when XRCH = "L".
4	O	WCK	Outputs a pulse having twice the frequency of LRCK. The pulse indicate the end of each word. Each word lasts until the fall of this pulse.
5	O	$\overline{\mathrm{DISCHG}}$	When the external PLL for clock extraction is unlocked, this pin outputs the Low-Active pulse which is used as the trigger for locking it.
6	O	VAR	Outputs the Low-Active pulse to determine the sink current for the external PLL.
7	—	Vss	GND pin.
8	O	REF	Outputs the High-Active pulse to determine the source current for the external PLL.
9	I	RXCP	Inputs the clock with 256 times the fs extracted by the external PLL.
10	O	APTL	Outputs the aperture correction pulse.
11	O	APTR	Outputs the aperture correction pulse.
12	O	BLK-ID	Outputs the block detection pulse for synchronization of the start of the C-bit block.
13	O	UNLOCK	Outputs the detection pulse of the lock status of the external PLL. "L" indicates the locked condition.
14	I	LSBF	Input used for switching the start of the serial audio data output to higher or lower rank. "H": LSB-first. "L": MSB-first.
15	I	RX	Inputs the digital I/O data obtained by demodulation in the digital audio interface format.
16	O	TXCP	Outputs the 128-fs clock used as the master clock of external equipment.
17	I	SLAV	Sets the data TXCP, WCK, LRCK and BCK output pins to the Hi-z status. "L": Normal. "H": Hi-z.
18	I	TEST	Switches between the Test mode and Normal mode. "H": Test mode. "L": Normal mode.
19	I	$\overline{\mathrm{CS}}$	Inputs the clock for generating $\overline{\mathrm{DISCHG}}$ required for the external PLL.
20	I	XRCH	Determines the polarity of the L and R clocks. "H": L CH High, R CH Low. "L": L CH Low, R CH High.
21	—	VDD	Power supply pin.
22	O	VBIT	Validity flag (V-bit) output.
23	O	UBIT	User-definable data (U-bit) output.
24	O	CBIT	Channel status data (C-bit) output.
25	O	EMPH	Emphasis information output. "H" for ON.
26	O	COPY	Copy inhibit information output. "L" for Inhibit.
27	O	ID1	ID1 output.
28	O	ID0	ID0 output.

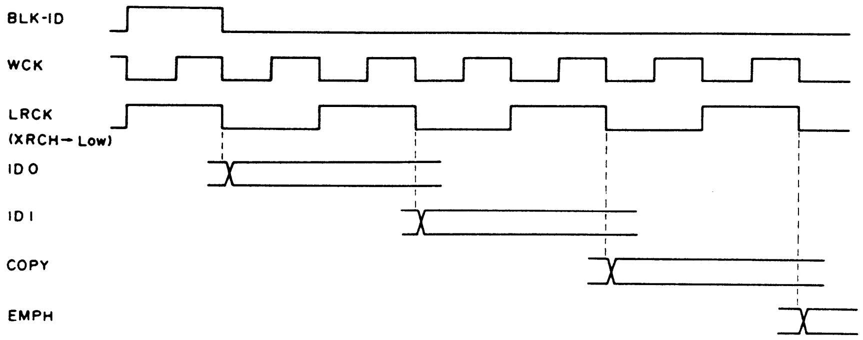
CIRCUIT DESCRIPTION

• Timing chart


(XRCH : "L")
Timing chart
BLK-ID
LRCK
R ch of previous block
L ch of the start of block
APTL
APTR

The timing chart above shows the relations between BLK-ID, LRCK, APTL and APTR.
BLK-ID: "H" indicates the beginning of a block. However, since the DATA output is still the RCH data of the end of the previous block, LRCK goes "High". (XRCH: "L")
The first data of the block will be output next time LRCK goes "Low". APTL and APTR are output at the timing above from the respective channel.

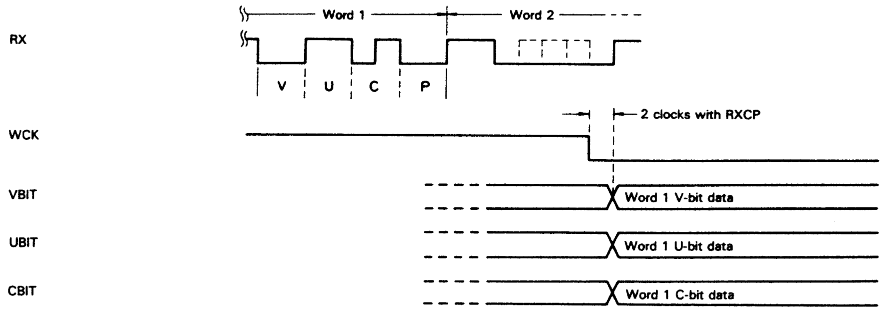
• Channel status data


BLK-ID
WCK
LRCK
(XRCH— Low)
ID 0
ID 1
COPY
EMPH

Among the channel-status data, ID0, ID1, COPY-Inhibit information and Emphasis information are output from the ID0, ID1, COPY and EMPH pins at the timing shown above.

CIRCUIT DESCRIPTION

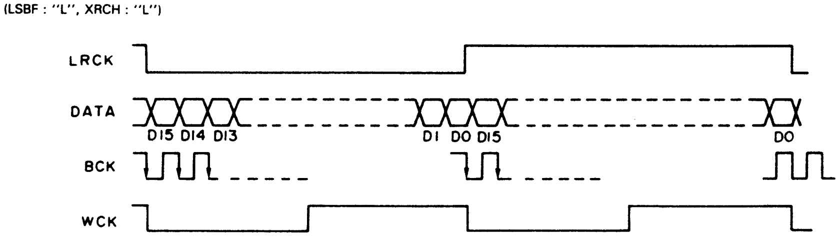
• User definable data, validity flag


Word 1
Word 2
RX
V
U
C
P
2 clocks with RXCP
WCK
VBIT
Word 1 V-bit data
UBIT
Word 1 U-bit data
CBIT
Word 1 C-bit data

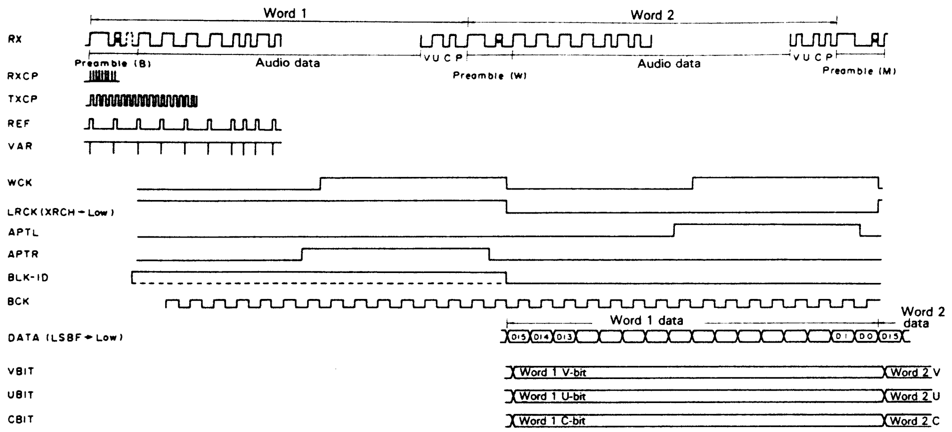
The digital I/O data, user-definable data and validity flag that are input to the RX pin in the digital interface format are output with a slight delay after the fall of WCK. The C-bit data is similarly output at the CBIT pin.

OPERATION

• Digital audio data

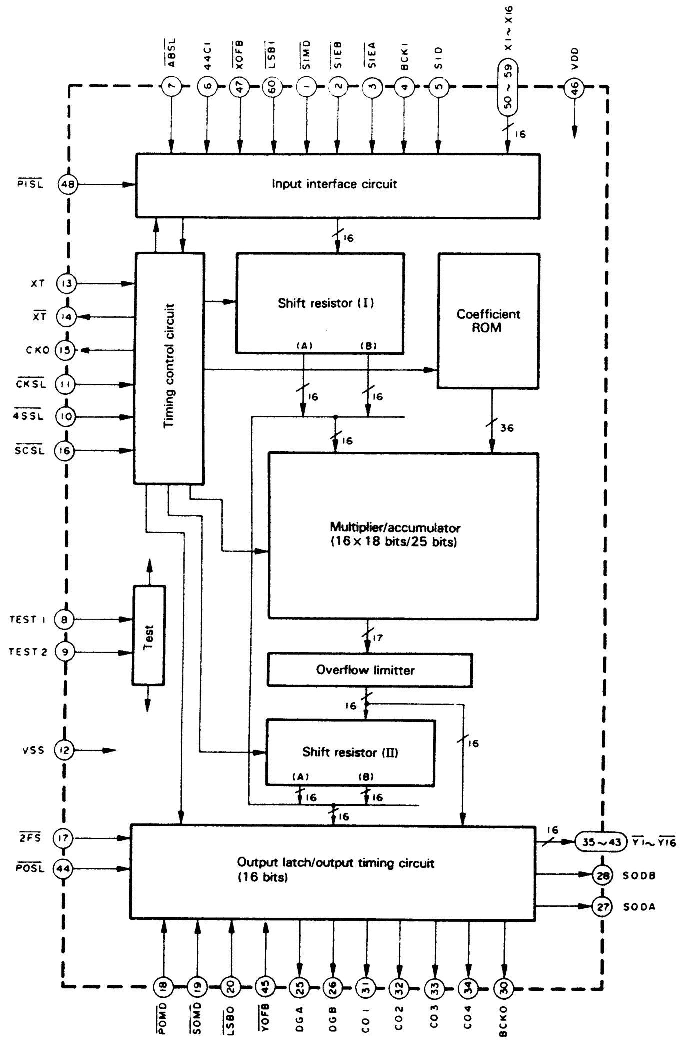

(LSBF : "L", XRCH : "L")
LRCK
DATA
D15 D14 D13
D1 D0 D15
D0
BCK
WCK

The signal timings are designed in consideration of facilitating connection to the D/A converter (CX20017, etc.). LRCK, DATA, BCK and WCK signals are output with the timing shown in the diagram above. The digital audio data (DATA output) is shifted by the negative edge of BCK before being output. The data output is MSB-first when the LSBF pin is "Low", and LSB-first when it is "High". The polarity of LRCK can be switched by the input at the XRCH pin. When XRCH is "Low", "Low" of LRCK indicates the L CH and the L CH data is output. Therefore, direct connection to CX20017 is possible by setting XRCH to "High".
For this operation, it is necessary to input a clock with a frequency below 500 Hz to the $\overline{CS}$ pin in order to generate DISCHG output required for the external PLL.


Word 1
Word 2
RX
Preamble (B)
Audio data
V U C P
Preamble (W)
Audio data
V U C P
Preamble (M)
RXCP
TXCP
REF
VAR
WCK
LRCK (XRCH = Low)
APTL
APTR
BLK-ID
BCK
Word 1 data
Word 2 data
DATA (LSBF = Low)
D15
D14
D13
D1
D0
D15
VBIT
Word 1 V-bit
Word 2 V
UBIT
Word 1 U-bit
Word 2 U
CBIT
Word 1 C-bit
Word 2 C

6-4. IC41:SM5804B

Block Diagram


ABSL 7
44CI 6
XOFB 47
LSBI 60
SIMD 1
SIEB 2
SIEA 3
BCKI 4
SID 5
X1 ~ X16 50 ~ 59
VDD 46
16
PISL 48
Input interface circuit
16
XT 13
XT 14
CKO 15
CKSL 11
4SSL 10
SCSL 16
Timing control circuit
Shift resistor (I)
(A)
(B)
Coefficient ROM
16
16
16
36
Multiplier/accumulator (16×18 bits/25 bits)
17
TEST 1 8
TEST 2 9
Test
Overflow limitter
16
16
VSS 12
Shift resistor (II)
(A)
(B)
16
16
16
2FS 17
POSL 44
Output latch/output timing circuit (16 bits)
16
35 ~ 43 Y1 ~ Y16
28 SODB
27 SODA
18 POMD
19 SOMD
20 LSBO
45 YOFB
25 DGA
26 DGB
31 CO1
32 CO2
33 CO3
34 CO4
30 BCKO

Note: In the above diagram, the pin used for two functions are treated as two separate terminals.

CIRCUIT DESCRIPTION

Explanation of Pins

With this LSI, the switching between the serial and parallel inputs/outputs is performed by the $\overline{PISL}$ and $\overline{POSL}$ pins. Some of the functions of pins X1 to X16 and $\overline{Y1}$ to $\overline{Y16}$ may be changed by this switching.

All the terminals of this unit function with $\overline{PISL}$ = H.

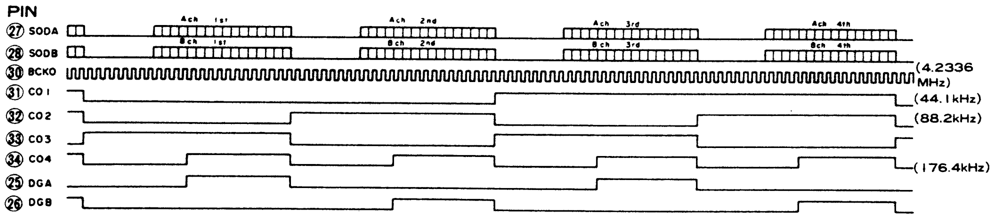
Note: ip designates an input jack with a pull-up resistor.

Pin No.	$\overline{PISL}$=H		$\overline{PISL}$=L		Function
	Pin Name	I/O	Pin Name	I/O	
1	$\overline{SIMD}$	ip			Serial input mode switching.
			X5	ip	Parallel data input (Bit 5).
2	$\overline{SIEB}$	ip			B CH serial input enable.
			X4	ip	Parallel data input (Bit 4).
3	$\overline{SIEA}$	ip			A CH serial input enable.
			X3	ip	Parallel data input (Bit 3).
4	BCKI	ip			Serial input bit clock input.
			X2	ip	Parallel data input (Bit 2).
5	SID	ip			Serial input data.
			X1	ip	Parallel data input (LSB).
6	44CI	ip	←	ip	44.1 kHz sync clock input.
7	$\overline{ABSL}$	ip	←	ip	$\overline{ABSL}$=H→44 CI clock, H/L = A CH/B CH. $\overline{ABSL}$=L→44 CI clock, H/L = B CH/A CH.
8	TEST 1	ip	←	ip	Test input 1 (Normally Open).
9	TEST 2	ip	←	ip	Test input 2 (Normally Open).
10	$\overline{4SSL}$	ip	←	ip	Normally $\overline{4SSL}$=H or Open. $\overline{4SSL}$=L when input is 16.9344 MHz or 17.2872 MHz.
11	$\overline{CKSL}$	ip	←	ip	$\overline{CKSL}$=H→External clock input. $\overline{CKSL}$=L→X'tal oscillation.
12	Vss		←		GND power supply pin (0 V).
13	XT	I	←	I	$\overline{CKSL}$=H→Clock input. $\overline{CKSL}$=L→X'tal oscillation input.
14	$\overline{XT}$	O	←	O	$\overline{CKSL}$=H→(Open). $\overline{CKSL}$=L→X'tal oscillation output.
15	CKO	O	←	O	Clock output.
16	$\overline{SCSL}$	ip	←	ip	System clock 96 fs→$\overline{SCSL}$=H. System clock 98 fs→$\overline{SCSL}$=L.
17	$\overline{2FS}$	ip	←	ip	Open.
18	$\overline{POMD}$	ip	←	ip	$\overline{POMD}$=H→Normal parallel output mode. $\overline{POMD}$=L→In-phase parallel output mode.
19	$\overline{SOMD}$	ip	←	ip	$\overline{SOMD}$=L with serial output.
20	$\overline{LSBO}$	ip	←	ip	$\overline{LSBO}$=H→MSB-first serial output. $\overline{LSBO}$=L→LSB-first serial output.
21	(NC)		←		(NC)
22	(NC)		←		(NC)
23	(NC)		←		(NC)
24	(NC)		←		(NC)
25	DGA	O	←	O	A CH deglitch control output.
26	DGB	O	←	O	B CH deglitch control output.
27	SODA	O			A CH serial data output.
			$\overline{Y1}$	O	Parallel output (inverted, LSB).
28	SODB	O			B CH serial data output.
			$\overline{Y2}$	O	Parallel output (inverted, Bit 2).
29	(NC)		←		Internally short-circuited to V_{DD}. Not to be connected externally.
30	BCKO	O			Serial output bit clock output.
			$\overline{Y3}$	O	Parallel output (inverted, Bit 3).
31	CO1	O			Serial output control clock 1.
			$\overline{Y4}$	O	Parallel output (inverted, Bit 4).
32	CO2	O			Serial output control clock 2.
			$\overline{Y5}$	O	Parallel output (inverted, Bit 5).
33	CO3	O			Serial output control clock 3.
			$\overline{Y6}$	O	Parallel output (inverted, Bit 6).
34	CO4	O			Serial output control clock 4.
			$\overline{Y7}$	O	Parallel output (inverted, Bit 7).
35	(NC)	Hz			(NC)
			$\overline{Y8}$	O	Parallel output (inverted, Bit 8).
36	(NC)	Hz			(NC)
			$\overline{Y9}$	O	Parallel output (inverted, Bit 9).
37	(NC)	Hz			(NC)
			$\overline{Y10}$	O	Parallel output (inverted, Bit 10).
38	(NC)	Hz			(NC)
			$\overline{Y11}$	O	Parallel output (inverted, Bit 11).
39	(NC)	Hz			(NC)
			$\overline{Y12}$	O	Parallel output (inverted, Bit 12).
40	(NC)	Hz			(NC)
			$\overline{Y13}$	O	Parallel output (inverted, Bit 13).
41	(NC)	Hz			(NC)
			$\overline{Y14}$	O	Parallel output (inverted, Bit 14).
42	(NC)	Hz			(NC)
			$\overline{Y15}$	O	Parallel output (inverted, Bit 15).
43	(NC)	Hz			(NC)
			$\overline{Y16}$	O	Parallel output (inverted, MSB).
44	$\overline{POSL}$	ip	←	ip	$\overline{POSL}$=H→Serial output system. $\overline{POSL}$=L→Parallel output system.
45	$\overline{YOFB}$	ip	←	ip	$\overline{YOFB}$=H→2's complement display output. $\overline{YOFB}$=L→Offset binary display output.
46	V_{DD}		←		+ve power supply pin (5 V).
47	$\overline{XOFB}$	ip	←	ip	$\overline{XOFB}$=H→2's complement display input. $\overline{XOFB}$=L→Offset binary display input.
48	$\overline{PISL}$	ip	←	ip	$\overline{PISL}$=H→Serial input system. $\overline{PISL}$=L→Parallel input system.
49	(NC)		←		(NC)

CIRCUIT DESCRIPTION

Pin No.	$\overline{PISL}$ = H		$\overline{PISL}$ = L		Function
	Pin Name	I/O	Pin Name	I/O	
50	(NC)	ip			(NC)
			X16	ip	Parallel data input (MSB).
51	(NC)	ip			(NC)
			X15	ip	Parallel data input (Bit 15).
52	(NC)	ip			(NC)
			X14	ip	Parallel data input (Bit 14).
53	(NC)	ip			(NC)
			X13	ip	Parallel data input (Bit 13).
54	(NC)	ip			(NC)
			X12	ip	Parallel data input (Bit 12).
55	(NC)	ip			(NC)
			X11	ip	Parallel data input (Bit 11).
56	(NC)	ip			(NC)
			X10	ip	Parallel data input (Bit 10).
57	(NC)	ip			(NC)
			X9	ip	Parallel data input (Bit 9).
58	(NC)	ip			(NC)
			X8	ip	Parallel data input (Bit 8).
59	(NC)	ip			(NC)
			X7	ip	Parallel data input (Bit 7).
60	$\overline{LSBI}$	ip			$\overline{LSBI}$ = H → MSB-first serial input. $\overline{LSBI}$ = L → LSB-first serial input.
			X6	ip	Parallel data input (Bit 6).

Serial Output Timing ($\overline{SOMD}$ = L, $\overline{SCSL}$ = H, system clock = 4.2336 MHz)

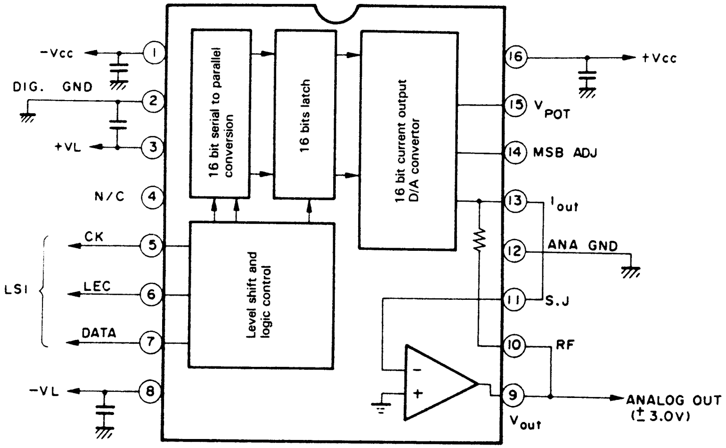


CIRCUIT DESCRIPTION

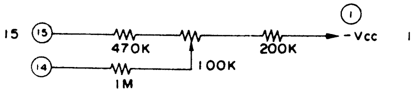
6-5. D/A converter IC

IC1, IC2: PCM56P-K

1. Block Diagram and Pin Connection


−Vcc
DIG. GND
+VL
N/C
CK
LEC
DATA
LSI
−VL
16 bit serial to parallel conversion
16 bits latch
16 bit current output D/A convertor
Level shift and logic control
+Vcc
V POT
MSB ADJ
I out
ANA GND
S.J
RF
ANALOG OUT
(± 3.0V)
V out
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

Note: The MSB error and differential linearity error with bipolar zero can be zero-adjusted by the external circuit shown below.

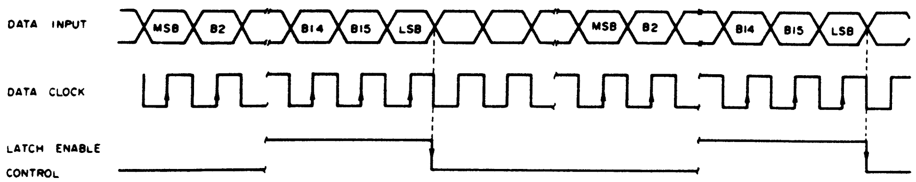

15
470K
100K
200K
−Vcc
1
14
1M

Pin No.	Pin name	Function
1	−Vcc	Analog negative power supply
2	DIG GND	Digital grounding
3	+VL	Logic positive power supply
4	NC	No connection
5	CK	Clock input
6	LEC	Latch enable control input
7	DATA	Data input
8	−VL	Logic negative power supply

Pin No.	Pin Name	Function
9	VOUT	Voltage output
10	RF	Feedback resistance
11	S.J	Summing junction (op amp input)
12	ANA GND	Analog grounding
13	IOUT	Current output
14	MSB ADJ	MSB adjustment pin
15	VPOT	Potentiometer pin
16	+Vcc	Analog positive power supply

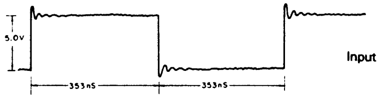
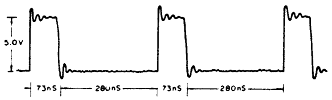
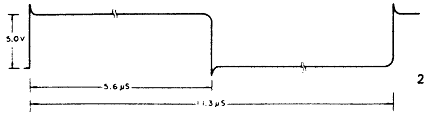
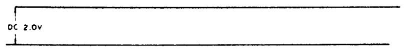
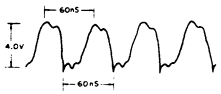
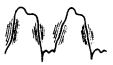
CIRCUIT DESCRIPTION

Timing Diagram

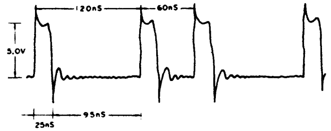
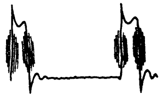
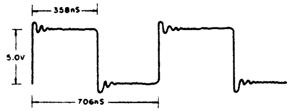
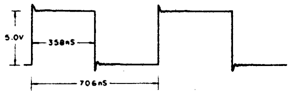
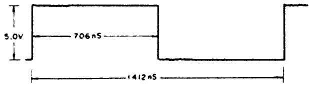
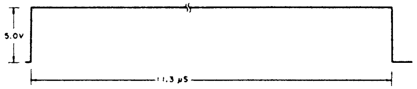
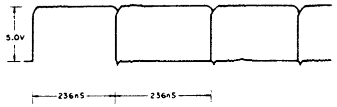
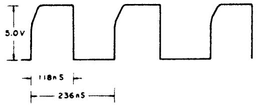
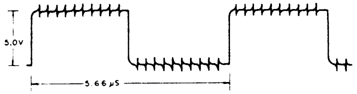

DATA INPUT
DATA CLOCK
LATCH ENABLE CONTROL
MSB
B2
B14
B15
LSB

- The data format is 2's complement, MSB-first.
- Data is latched in the shift register at the rise of data clock.
- Latch enable control is performed by the frequency twice the L/R clock, and the LSB corresponds to its rise. It shall be synchronized with the fall of data clock.

7. WAVEFORMS AT MAJOR DIGITAL CIRCUIT PINS (When CD digital signal is connected)

Pin	Output Waveform (Except with IC41 pins 27 and 28, outputs are present even when CD player is not played.)	
IC25⑤ (TC74HC386P)	 5.0V 353nS 353nS Input signal "0" (32 f)	The actual waveform is superimposed with the waveform of "1".
IC25⑩	 5.0V 73nS 280nS 73nS 280nS Input signal "0" (64 f)	The actual waveform is superimposed with the waveform of "1".
IC27① IC27③ (MC4044P)	 5.0V 5.6μS 11.3μS 2f	When a CD player is not connected, the output is present at IC27 pin 3 only (in free-run condition, however).
IC28⑬ (SN74LS624N)		
※ IC28⑧	 60nS 4.0V 60nS	 : Defective. * Shall be no jitter.

CIRCUIT DESCRIPTION

Pin	Output Waveform (Except with IC41 pins 27 and 28, outputs are present even when CD player is not played.)	
※ IC32⑧ (TC74HC86P)	 120nS 60nS 5.0V 25nS 95nS	 : Defective. * Shall be no jitter.
IC42⑮ (CXD1076P)	 358nS 5.0V 706nS 1.41MHz	32fs
IC42①	 5.0V 358nS 706nS 1.41MHz	32fs
IC42②	 5.0V 706nS 1412nS 708.2kHz	16fs
IC42③	 44.1kHz	fs
IC41㉗ IC41㉘ (SM5804B) (W8 ⑧⑦)	 5.0V 236nS 236nS	The output is present only during CD player playing.
IC41㉚ (W8 ⑥)	 5.0V 118nS 236nS 4.23MHz	96fs
IC41㉛ (W8 ⑤)	 176.4kHz	4fs

※ Note: Even when the input cable is apart from the CD player's DIGITAL OUT, the output from IC28 pin 8 and IC32 pin 8 are output from the free-run (time-free) VCO.

ADJUSTMENT

POWER AMP UNIT (X07-2320-82)

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	–	Connect a DC voltmeter across CP3 (L) CP4 (R)	VOLUME: 0	VR1 (L) VR2 (R)	9mV	(a)

SIGNAL PROCESSOR UNIT (X32-1112-71)

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	OUTPUT LEVEL ADJUSTMENT	Connect the digital output/input jacks and lock the PLL of the KA-3300D.	Connect a load of 10 kΩ to the D/A DIRECT OUT jack and connect an AC voltmeter across the load.	Play the 1kHz, 0 dB signal of the test CD.	VR1 (L) VR2 (R)	Adjust so that the output voltage is 2 V.	(b)

REGLAGES

UNITE D'AMPLIFICATEUR PRINCIPAL (X07-2320-82)

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINS L'ALIGNEMENT	ALIGNER POUR	FIG.
1	COURANT DE POLARISATION	–	Connecter un voltmètre de CC sur CP3 (G) CP4 (D)	VOLUME: 0	VR1 (G) VR2 (D)	9mV	(a)

UNITE DE DISPOSITIF DE TRAITEMENT DE SIGNAUX (X32-1112-71)

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINS L'ALIGNEMENT	ALIGNER POUR	FIG.
1	REGLAGE DE NIVEAU DE SORTIE	Connecter les jacks de sortie/entrée numérique et verrouiller le circuit de verrouillage de phase (PLL) du KA-3300D.	Connecter une charge de 10kΩ au jack "DIRECT OUT" N/A et connecter un voltmètre CA à travers la charge.	Faire jouer le signal de 1kHz, 0 dB du CD d'essai.	VR1 (G) VR2 (D)	Régler pour que la tension de sortie soit de 2 V.	(b)

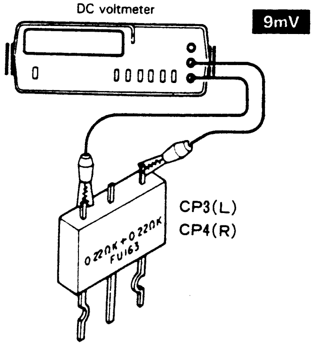
ABGLEICH

HAUPTVERSTÄRKER (X07-2320-82)

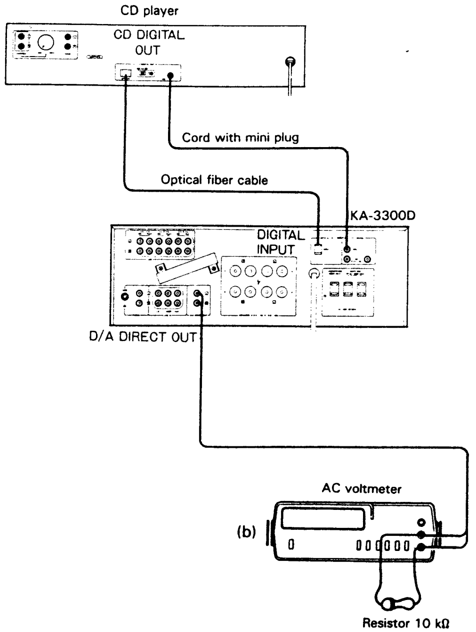
NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	LEERLAUFSTROM	–	Einen Gleichspannungsmesser über CP3 (L) CP4 (R) anschließen.	VOLUME: 0	VR1 (L) VR2 (R)	9mV	(a)

SIGNALPROZESSOR (X32-1112-71)

NR.	GEGENSTAND	EINGANGS EINSTELLUNG	AUSGANGS-EINSTELLUNGS	VERSTÄRKER EINSTELLUNG	ABGLEICH-PUNKTE	ABGLEICHEN FÜR	ABB.
1	AUSGANGSPEGEL-EINSTELLUNG	Die Digital-Eingang/Ausgang-Buchsen anschließen und den PLL des KA-3300D verriegeln.	Eine Last von 10kΩ an die D/A DIRECT OUT-Buchse anschließen und ein Wechselstrom-Voltmeter über die Last anschließen.	Das 1kHz, 0 dB Signal der Test-CD spielen.	VR1 (L) VR2 (R)	So einstellen, daß die Ausgangsspannung 2 V beträgt.	(b)



(a)



VOLTAGE TABLES

X11-2350-81

Q2

E	3.2V
C	3.3V
B	2.8V

Q3

E	3.2V
C	29.4
B	1.2V

Q4

E	LAMP ON: −2.0V LAMP OFF: −27.5V
C	–
B	LAMP ON: −1.5V LAMP OFF: −27.5V

IC1

4	−16V
5	0V
6	0.1V
7	0.1V
8	16V

CN4

1	−16V
2	16V
3	–
4	LAMP ON: −27.6V LAMP OFF: −29.3V
5	37.8V
6	1.2V
7	0V

CN3

1	K3 ON: 12.1V K3 OFF: 0V
2	–
3	MUTE SW BREAK: 16.5V MUTE SW MAKE: 6.6V
4	–
5	14.5V
6	0.7V

CN15

1	0.7V

CN16

5	56V

CN2

1	MC: 0V MM: 19.5V

X32-1110-00

Q1, 2, 3

E	5V
C	–
B	–

Q7

E	11.9V
C	18.3V
B	12.4V

Q8

E	−11.8V
C	−18.3V
B	−12.4V

IC1, 2

1	−5V
2	0V
3	5V
8	−5V
16	5V

IC3～10

4	−11.8V
8	11.9V

Q21

1, 7	0V
14	5V

IC24

7, 9, 11, 13	0V
14	5V

Q22

5	5V

IC25

6, 14	5V
7	0V

IC26

1	0V
3, 10, 11	5V

IC27

7	0V
14	5V

IC28

1, 7	0V
9, 14	5V
13	2V

IC31, 33

2, 4, 10, 12, 14, 15	5V

IC32, 34, 36, 39

7	0V
14	5V

IC49

4	−18.3V
8	18.3V

IC35

3, 10, 11	5V

IC47

IN	10.4V
OUT	5V
GND	0V

IC48

IN	−10.5V
OUT	−5V
GND	0V

IC41

1	0V
2, 3, 7	5V
10, 11, 12	0V
16	5V
19	0V
20	5V
44～48	5V
60	5V

IC42

7, 14	0V
17, 18, 20	0V
21	5V

IC45

IN	11.9V
OUT	5V
GND	0V

IC43

3, 5, 9, 11	0V

IC44

1, 7	0V

IC46

IN	−11.9V
OUT	−5V
GND	0V

IC29

1, 4, 10, 13	5V

X07-2320-82

Q1, 5

E	–
C	7.7V
B	–

Q3, 7

E	–
C	−7.1V
B	–

Q9

E	71.4V
C	7.6V
B	70.4V

Q11

E	1.3V
C	0V
B	0.6V

Q13

E	−71.2V
C	–
B	−71.2V

Q15

E	−1.3V
C	−7.6V
B	−0.6V

Q17

E	7.7V
C	72.4V
B	7.7V

Q18

E	–
C	73.2V
B	–

Q19

E	−7.1V
C	−72.3V
B	−7.7V

Q26

E	–
C	−73.2V
B	–

Q21

E	−1.8V
C	−1.2V
B	−0.4V

Q23

E	–
C	77.8V
B	−14V

Q24

E	–
C	−7.3V
B	−14V

Q25, 26

E	–
C	73.2V
B	–

Q27, 28

E	–
C	−73.2V
B	–

Q29

E	–
C	40.7V
B	–

Q31

E	–
C	−40.7V
B	–

Q33

E	–
C	–
B	68V

Q35

E	0V
C	−3.7V
B	0V

Q37

E	73.2V
C	0V
B	72.9V

Q55

E	49.5V
C	27.3V
B	49V

Q56

E	−49.6V
C	−19.6V
B	−49V

Q51

E	57.3V
C	71V
B	57.8V

Q52

E	−57.4V
C	−71.3V
B	−58V

Q53

E	8.2V
C	58V
B	8.8V

Q54

E	0V
C	−58V
B	−0.6V

Q58

E	17V
C	21.5V
B	17.8V

Q59

E	20.6V
C	28.8V
B	21.2V

Q60

E	−20.7V
C	−27.0V
B	−21.3V

Q61

E	8.2V
C	21.3V
B	8.8V

Q62

E	−8.2V
C	−21.2V
B	−8.8V

IC1

1	−0.6V
4	−73.2V
6	−42.1V
9	0V
11	42.0V
13	73.2V

IC2

4	−73.2V
6	−42.1V
11	42.0V
13	73.2V

X08-2180-82

Q35, 36, 37, 38

E	−56.6V
C	–
B	−56.0V

Q43, 44

E	–
C	1.9V
B	56.5V

Q9, 10

E	−15.5V
C	–
B	−15.0V

Q15, 16, 17, 18

G	0V
S	0.1V
D	–

Q25

G1	–
S1	0.4V
D1	–
G2	–
S2	0.4V
D2	–

Q31, 33

E	–
C	–
B	10.0V

Q48

E	14.0V (15.1V)
C	14.0V (−27.1V)
B	13.5V (15.1V)

IC3

2	H: 13.8V L: 0.2V
3	R: 1.4V P: 14.0V
5, 6	14.0V (15.1V)
7, 8, 9	0V
10, 11	14.0V (15.1V)
12, 13	0V
16	14.0V (15.1V)

Q45

E	–
C	–
B	H: 0.7V L: 0.1V

Q46

E	R: 1.8V P: 1.6V
C	R: 6.1V P: 1.8V
B	R: 0V P: 2.3V

Q47

E	R: 1.8V P: 1.6V
C	R: 1.4V P: 14.0V
B	–

Q39, 40

E	–
C	56.5V
B	–

Q1～4

E	−0.6V
C	–
B	0V

Q11, 12

E	–
C	25.4V
B	–

Q19～22

E	–
C	7.7V
B	–

Q26

G1	–
S1	0.6V
D1	–
G2	–
S2	0.6V
D2	–

Q28, 30

E	–
C	9.9V
B	2.85V

Q49

E	14.0V (15.1V)
C	–
B	13.4V (15.1V)

Q41, 42

E	–
C	−1.9V
B	–

Q7, 8

E	–
C	7.7V
B	–

Q13, 14

E	–
C	−25.1V
B	–

Q23, 24

E	−15.5V
C	–
B	−15.0V

Q27, 29

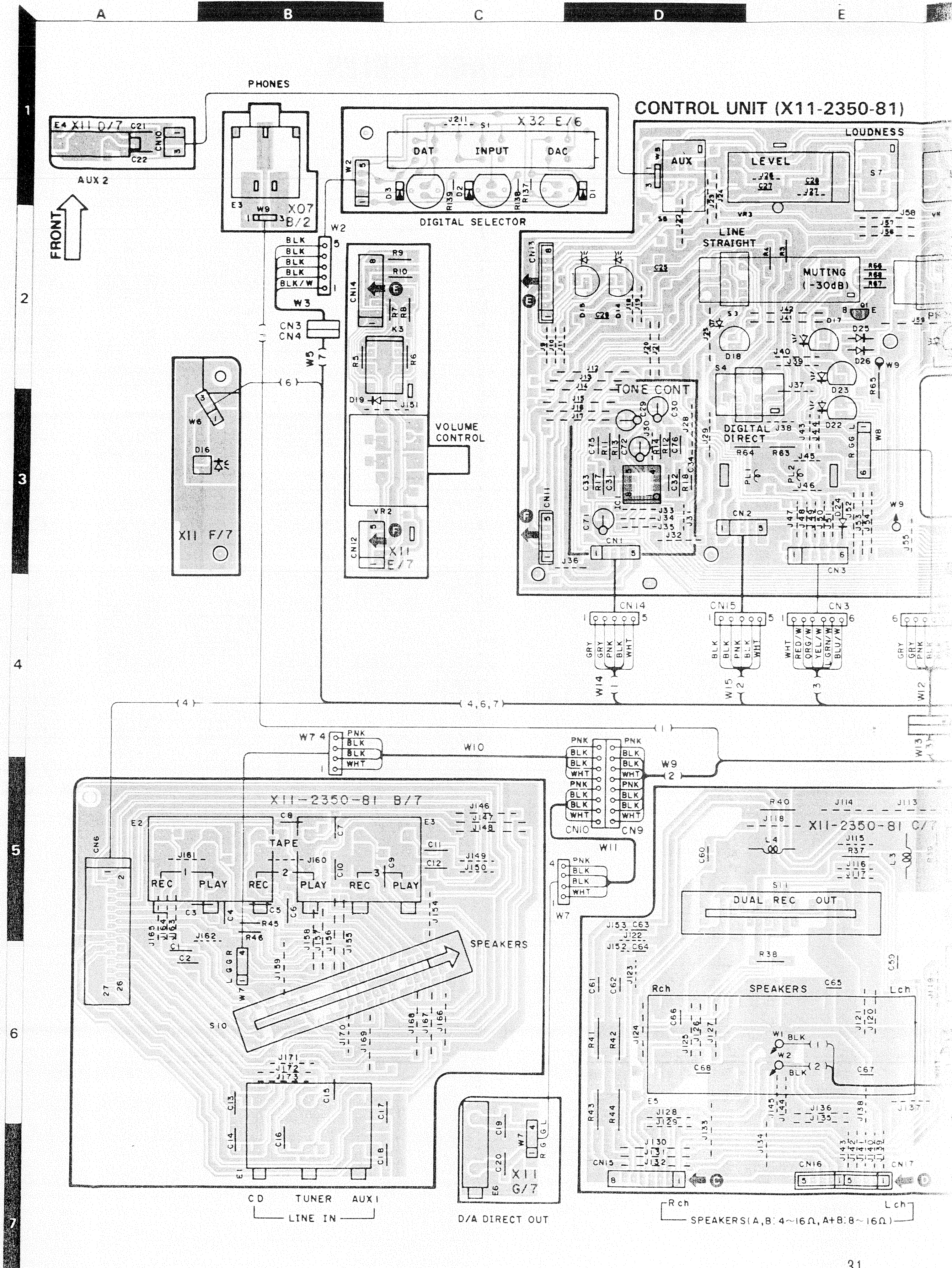
E	–
C	10.0V
B	2.8V

Q32, 34

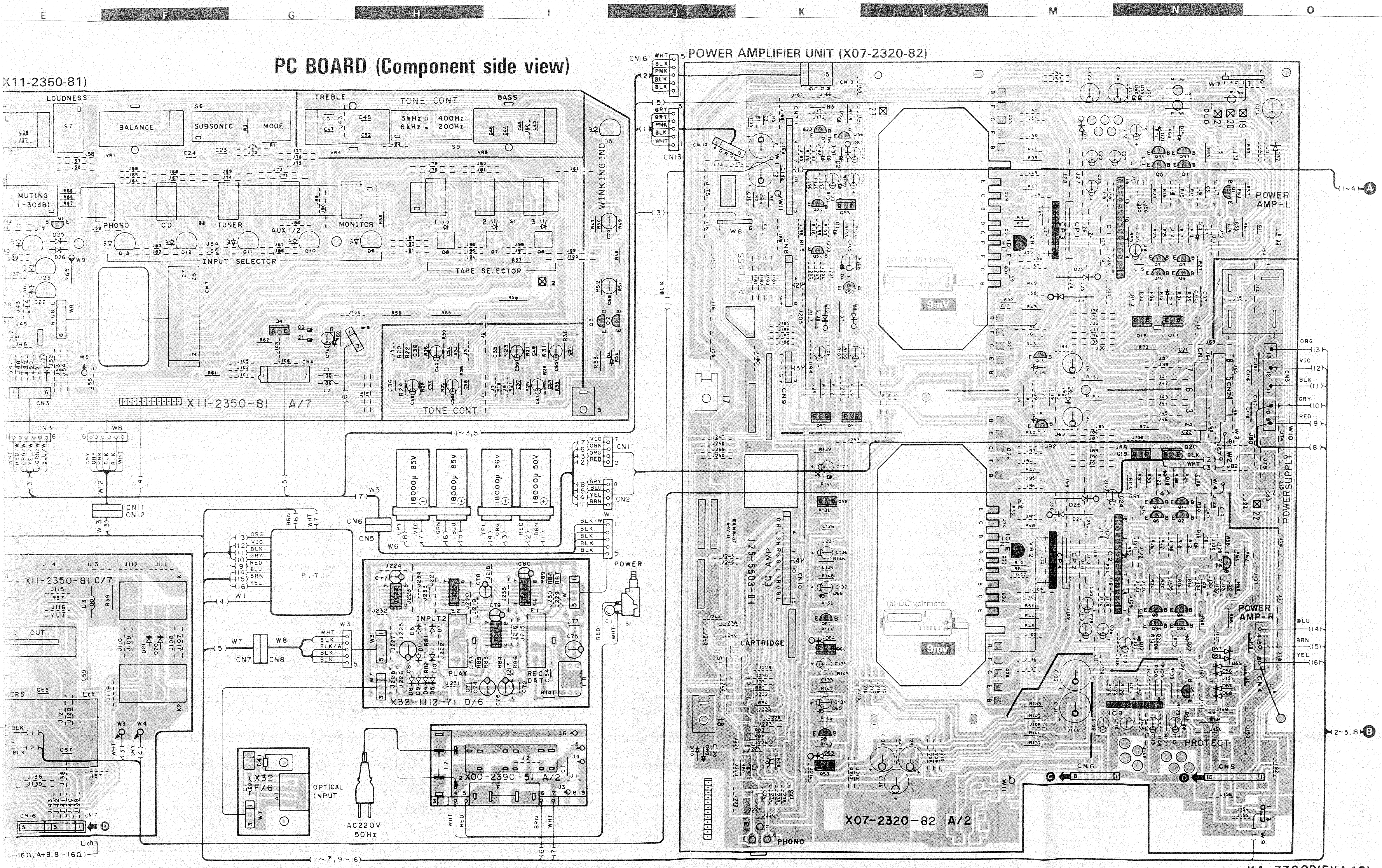
E	–
C	–
B	9.9V

IC1, 2

2	7.7V
3	7.7V
4	−20.7V
5	7.7V
6	7.7V
8	20.9V


A
B
C
D
E
1
2
3
4
5
6
7
CONTROL UNIT (X11-2350-81)
PHONES
X11 D/7
AUX 2
FRONT
X07 B/2
X32 E/6
DAT
INPUT
DAC
DIGITAL SELECTOR
AUX
LEVEL
LOUDNESS
LINE STRAIGHT
MUTING (-30dB)
TONE CONT
DIGITAL DIRECT
VOLUME CONTROL
X11 E/7
X11 F/7
CN3
CN4
CN14
CN15
CN3
W14
W15
W12
W13
W10
W9
W11
W7
CN10
CN9
X11-2350-81 B/7
TAPE
REC
PLAY
SPEAKERS
X11-2350-81 C/7
DUAL REC OUT
Rch
Lch
X11 G/7
CD
TUNER
AUX1
LINE IN
D/A DIRECT OUT
Rch
Lch
SPEAKERS(A,B: 4~16Ω, A+B: 8~16Ω)
GRY
PNK
BLK
WHT
BLK/W
RED/W
ORG/W
YEL/W
GRN/W
BLU/W

PC BOARD (Component side view)


E
F
G
H
I
J
K
L
M
N
O
X11-2350-81)
LOUDNESS
BALANCE
SUBSONIC
MODE
TREBLE
TONE CONT
3kHz
6kHz
400Hz
200Hz
BASS
MUTING (-30dB)
PHONO
CD
TUNER
AUX 1/2
MONITOR
INPUT SELECTOR
TAPE SELECTOR
WINKING IND
X11-2350-81 A/7
TONE CONT
X11-2350-81 C/7
P.T.
POWER
INPUT2
PLAY
REC DAT
X32-1112-71 D/6
X32 F/6
OPTICAL INPUT
AC220V 50Hz
X00-2390-51 A/2
POWER AMPLIFIER UNIT (X07-2320-82)
A CLASS
(a) DC voltmeter
9mV
POWER AMP-L
POWER AMP-R
POWER SUPPLY
EQ AMP
CARTRIDGE
PHONO
PROTECT
X07-2320-82 A/2
18000μ 85V
18000μ 85V
18000μ 56V
18000μ 50V
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN11
CN12
CN13
CN16
CN17
ORG
VIO
BLK
GRY
RED
BLU
BRN
YEL
WHT
GRN
PNK
A
B
C
D
Lch
16Ω, A+B:8~16Ω

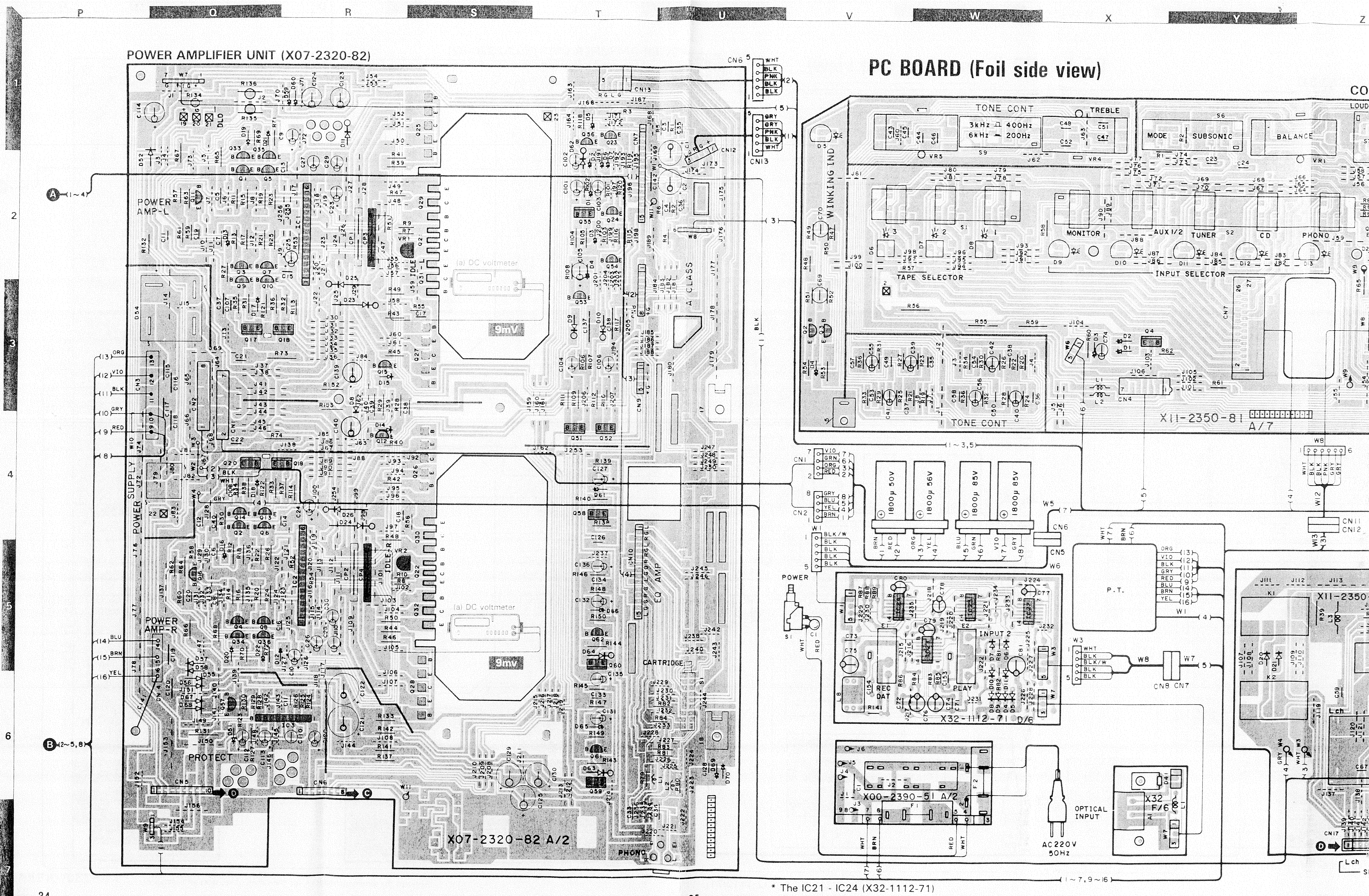
* The IC21 - IC24 (X32-1112-71) are installed in pattern side.

Refer to the schematic diagram for the values of resistors and capacitors.

KA-3300D(E)(A/2)

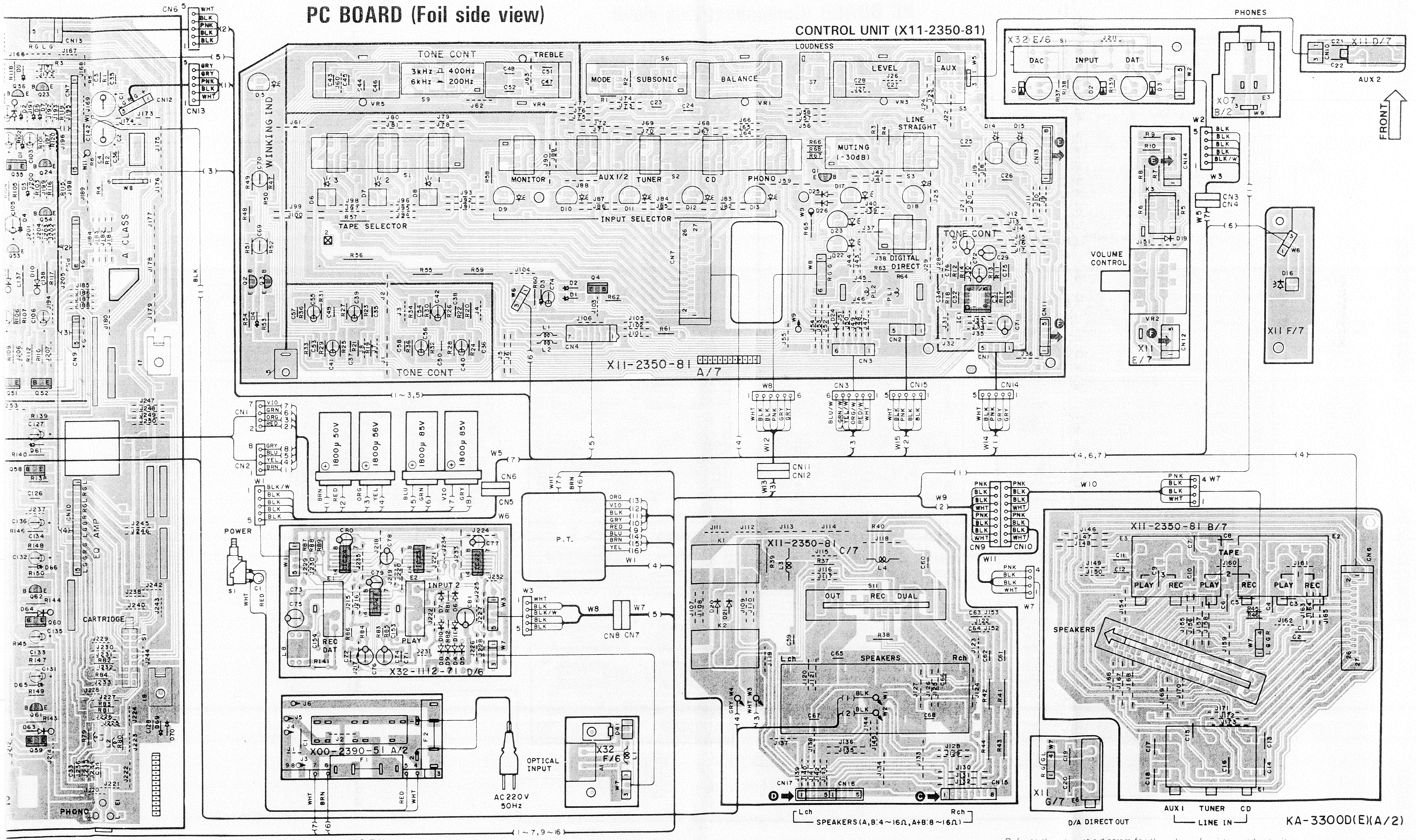
POWER AMPLIFIER UNIT (X07-2320-82)

PC BOARD (Foil side view)


P
Q
R
S
T
U
V
W
X
Y
Z
1
2
3
4
5
6
7
A (1~4)
B (2~5,8)
POWER AMP-L
POWER AMP-R
POWER SUPPLY
PROTECT
IDLE-L
IDLE-R
VR1
VR2
(a) DC voltmeter
9mV
(a) DC voltmeter
9mV
A CLASS
EQ AMP
CARTRIDGE
PHONO
X07-2320-82 A/2
CN5
CN6
CN13
CN12
CN6
TONE CONT
TREBLE
3kHz 400Hz
6kHz 200Hz
MODE
SUBSONIC
BALANCE
WINKING IND
MONITOR
AUX1/2
TUNER
CD
PHONO
TAPE SELECTOR
INPUT SELECTOR
TONE CONT
X11-2350-81 A/7
1800μ 50V
1800μ 56V
1800μ 85V
1800μ 85V
CN1
CN2
CN5
CN6
CN11
CN12
P.T.
POWER
S1
INPUT 2
REC DAT
PLAY
X32-1112-71 D/6
X00-2390-51 A/2
OPTICAL INPUT
AC220V 50Hz
X32 F/6
X11-2350
Lch
CN8 CN7
(1~7,9~16)

* The IC21 - IC24 (X32-1112-71) are installed in pattern side.

PC BOARD (Foil side view)


CONTROL UNIT (X11-2350-81)
X11-2350-81 A/7
X11-2350-81 B/7
X11-2350-81 C/7
X32-1112-71 D/6
X32 E/6
X11 E/7
X11 F/7
X32 F/6
X11 G/7
X00-2390-51 A/2
X07 B/2
X11 D/7
TONE CONT
TREBLE
3kHz ⊓ 400Hz
6kHz ⌒ 200Hz
MODE
SUBSONIC
BALANCE
LOUDNESS
LEVEL
AUX
LINE STRAIGHT
MUTING (-30dB)
WINKING IND
MONITOR
AUX1/2
TUNER
CD
PHONO
TAPE SELECTOR
INPUT SELECTOR
DIGITAL DIRECT
VOLUME CONTROL
PHONES
AUX 2
FRONT
A CLASS
EQ AMP
CARTRIDGE
PHONO
POWER
P.T.
INPUT 2
REC DAT
PLAY
OPTICAL INPUT
AC220V 50Hz
SPEAKERS
OUT REC DUAL
Lch
Rch
TAPE
PLAY REC PLAY REC PLAY REC
AUX1 TUNER CD
LINE IN
D/A DIRECT OUT
SPEAKERS(A,B:4~16Ω,A+B:8~16Ω)
1800µ 50V
1800µ 56V
1800µ 85V
1800µ 85V

KA-3300D(E)(A/2)

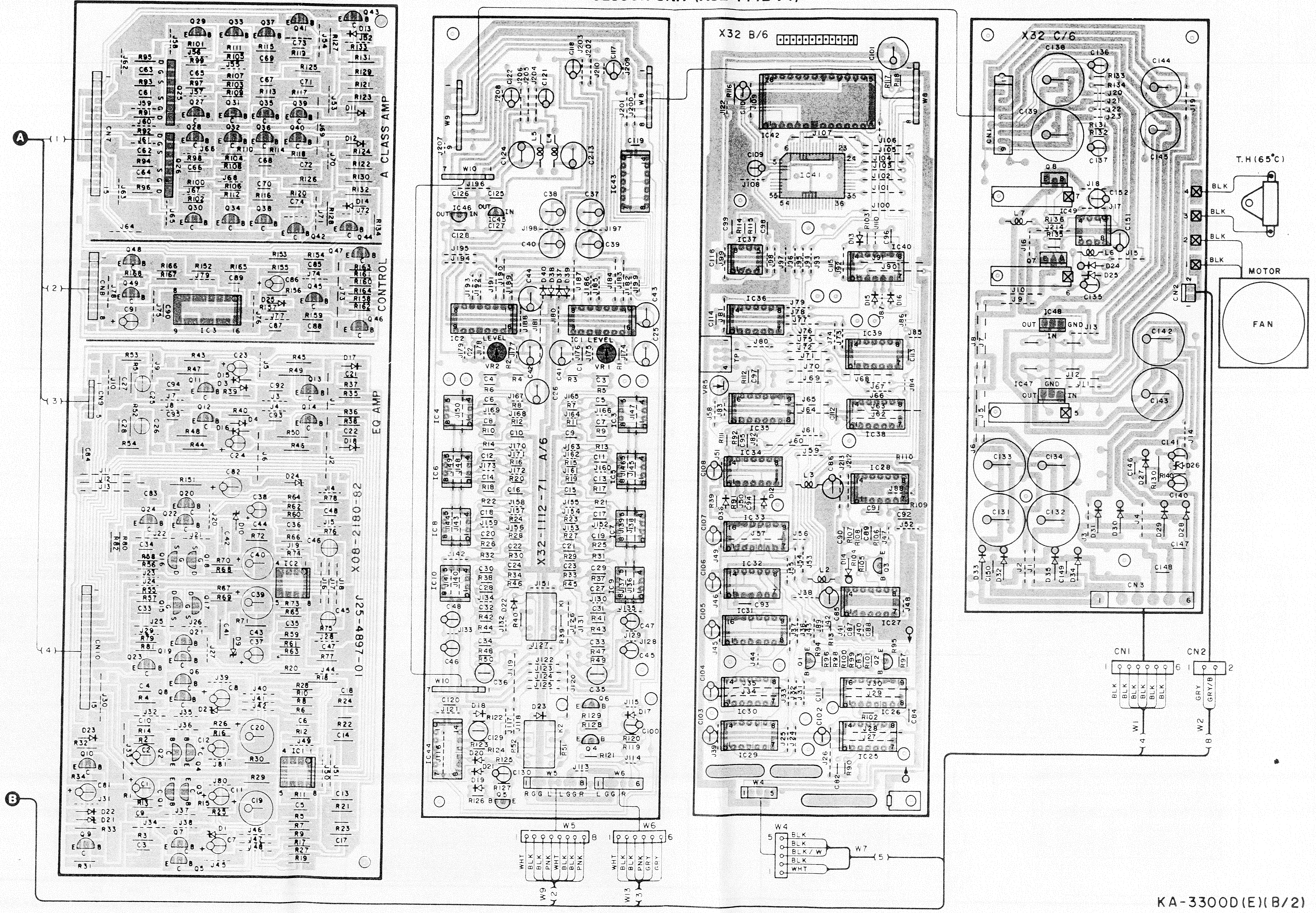
Refer to the schematic diagram for the values of resistors and capacitors.

* The IC21 - IC24 (X32-1112-71) are installed in pattern side.

PC BOARD (Component side view)

PRE AMPLIFIER UNIT (X08-2180-82)

PROCESSOR UNIT (X32-1112-71)


A
B
A CLASS AMP
CONTROL
EQ AMP
X08-2180-82
J25-4897-01
X32-1112-71 A/6
X32 B/6
X32 C/6
IC1 LEVEL
IC2 LEVEL
VR1
VR2
IC41
T.H(65°C)
BLK
BLK
BLK
BLK
MOTOR
FAN
CN1
CN2
CN3
W1
W2
W4
W5
W6
W7
W9
W13
BLK BLK BLK BLK BLK
GRY GRY/B
BLK BLK BLK/W BLK WHT
WHT BLK BLK PNK WHT BLK BLK PNK
WHT BLK BLK PNK GRY GRY

* The IC41 (X32-) (B/6) is installed in pattern side.

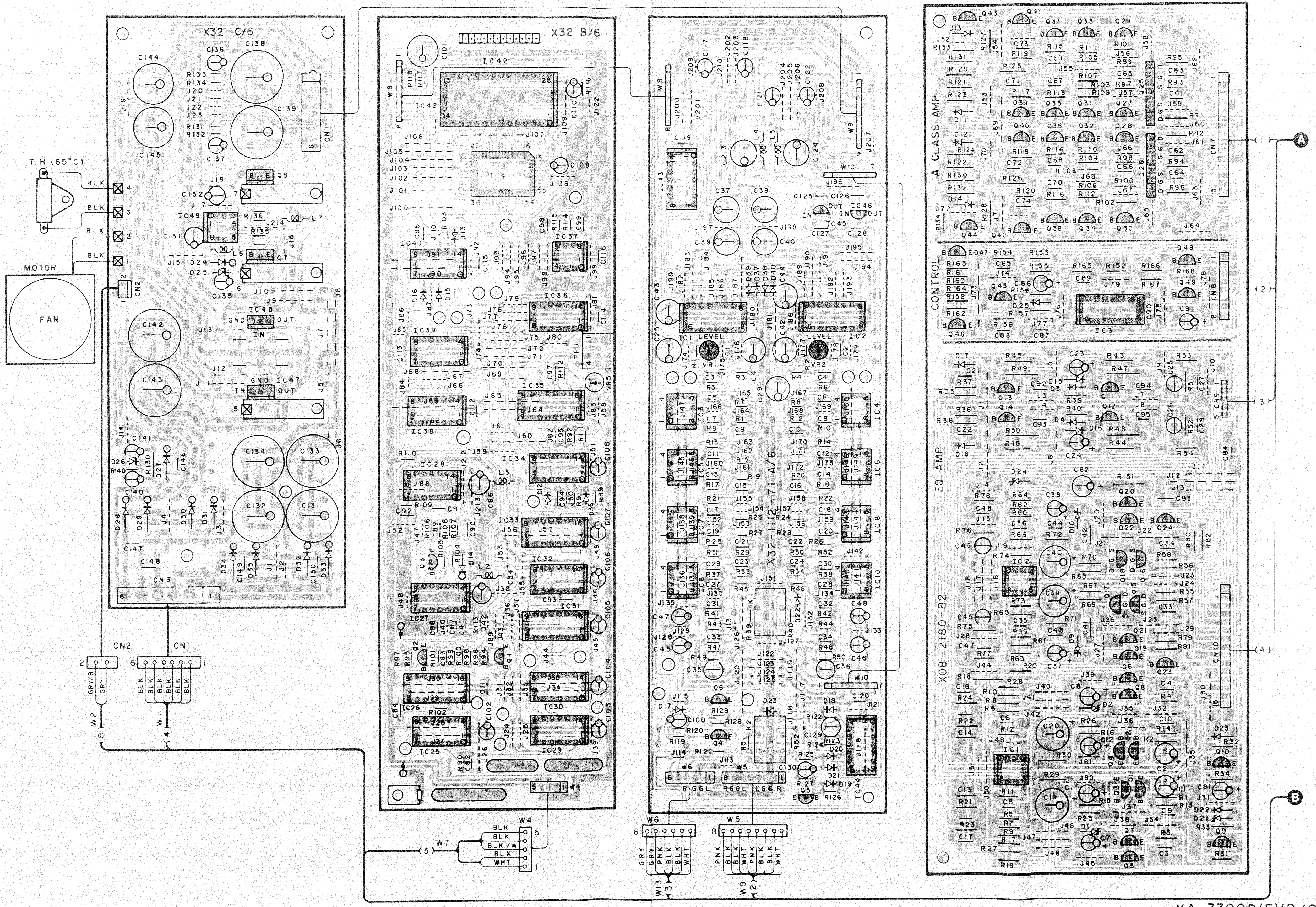
KA-3300D(E)(B/2)

Refer to the schematic diagram for the values of resistors and capacitors.

PC BOARD (Foil side view)

PROCESSOR UNIT (X32-1112-71)

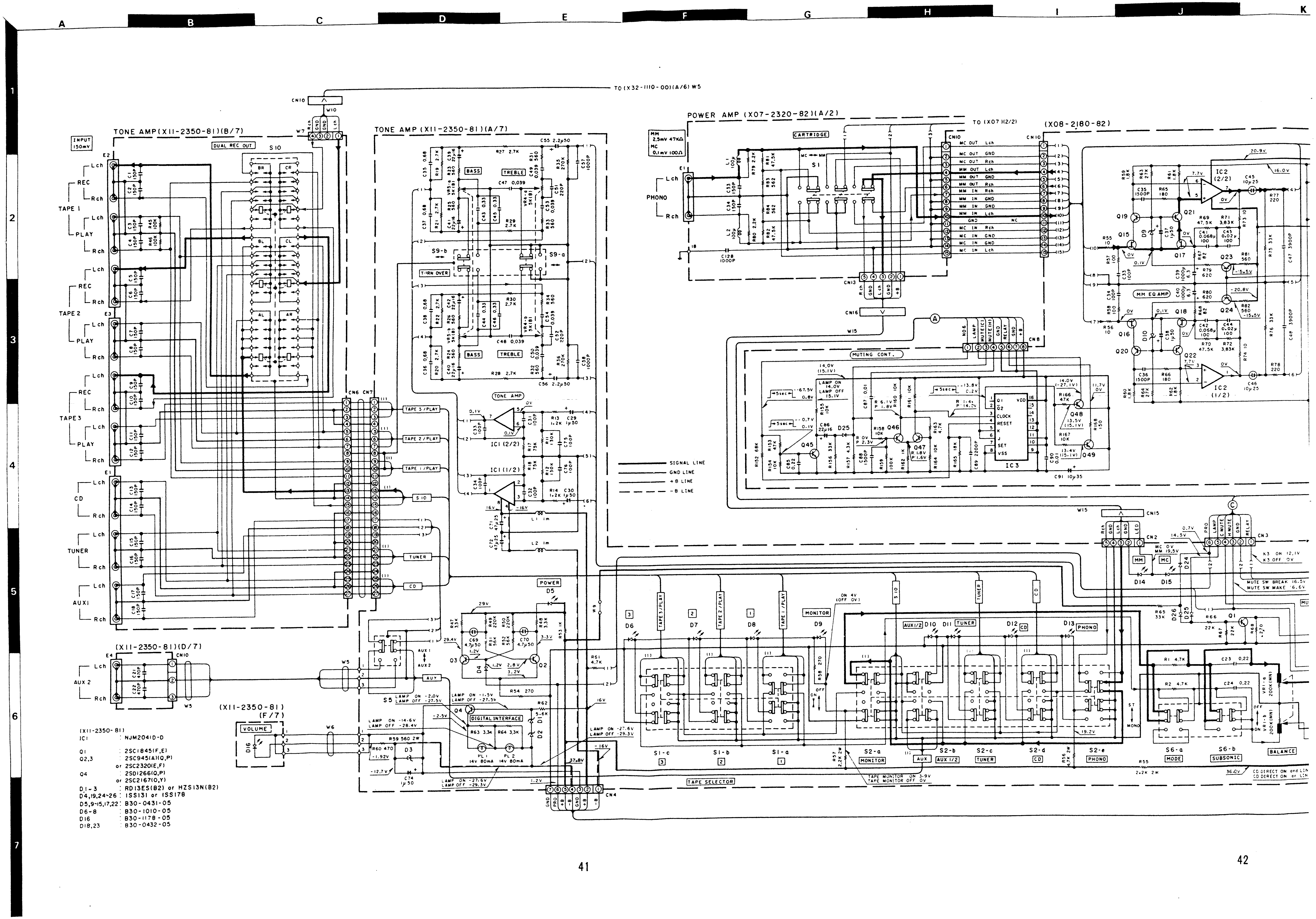
PRE AMPLIFIER UNIT (X08-2180-82)


X32 C/6
X32 B/6
X32-1112-71 A/6
T.H (65°C)
MOTOR
FAN
BLK
CN1
CN2
CN3
GRY/B
GRY
W1
W2
W4
W5
W6
W7
W8
W9
W10
W13
BLK/W
WHT
PNK
IC42
IC41
A CLASS AMP
CONTROL
EQ AMP
X08-2180-82
CN7
CN8
CN9
CN10
A
B
LEVEL
VR1
VR2
IN
OUT
GND

* The IC41 (X32-) (B/6)
is installed in pattern side.

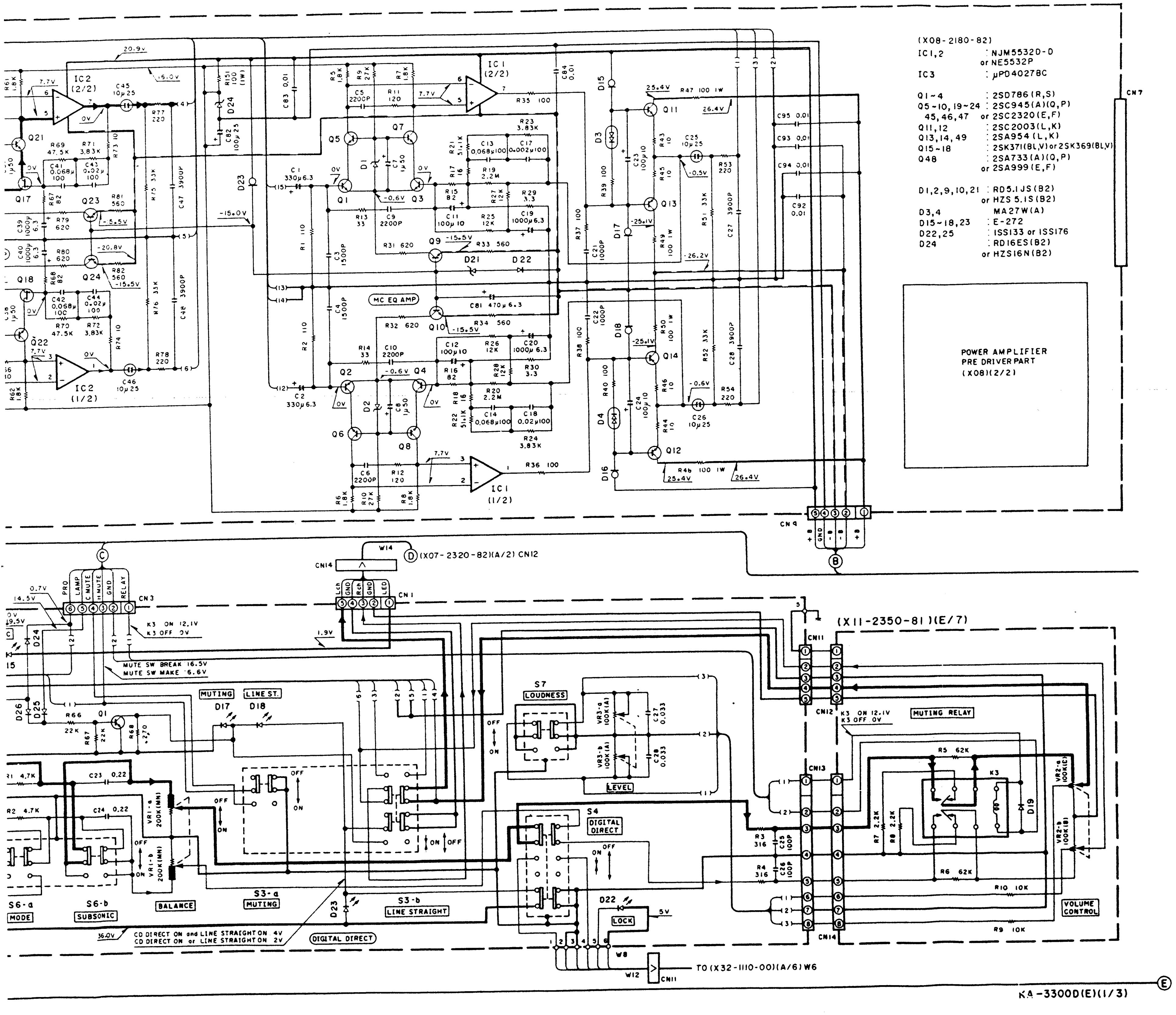
KA-3300D(E)(B/2)

Refer to the schematic diagram for the values of resistors and capacitors.


A
B
C
D
E
F
G
H
I
J
K
1
2
3
4
5
6
7
TO (X32-1110-00)(A/6) W5
CN10
W10
W7
TONE AMP (X11-2350-81)(B/7)
TONE AMP (X11-2350-81)(A/7)
POWER AMP (X07-2320-82)(A/2)
TO (X07)(2/2)
(X08-2180-82)
INPUT 150mV
DUAL REC OUT
S10
TAPE 1
TAPE 2
TAPE3
REC
PLAY
Lch
Rch
CD
TUNER
AUX1
AUX 2
E1
E2
E3
E4
CN6
CN7
TAPE 3/PLAY
TAPE 2/PLAY
TAPE 1/PLAY
S 10
TUNER
CD
AUX
BASS
TREBLE
T-IRN OVER
S9-a
S9-b
TONE AMP
IC1 (2/2)
IC1 (1/2)
L1 1m
L2 1m
POWER
D5
MM 2.5mV 47KΩ
MC 0.1mV 100Ω
CARTRIDGE
PHONO
S1
MM EQ AMP
IC2 (2/2)
IC2 (1/2)
MUTING CONT.
IC3
CN8
CN13
CN16
W15
CN15
CN2
CN3
CN4
SIGNAL LINE
GND LINE
+B LINE
−B LINE
(X11-2350-81)(D/7)
(X11-2350-81) (F/7)
VOLUME
D16
W5
W6
DIGITAL INTERFACE
PL1 14V 80mA
PL2 14V 80mA
S5
MONITOR
TAPE SELECTOR
S1-c
S1-b
S1-a
S2-a
S2-b
S2-c
S2-d
S2-e
AUX1/2
PHONO
S6-a
S6-b
MODE
SUBSONIC
BALANCE
ST
MONO
MM
MC
MUTE SW BREAK 16.5V
MUTE SW MAKE 6.6V
TAPE MONITOR ON 3.9V
TAPE MONITOR OFF 0V
CD DIRECT ON and LIN
CD DIRECT ON or LIN

(X11-2350-81)
IC1 : NJM2041D-D

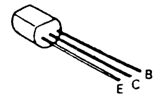
Q1 : 2SC1845(F,E)
Q2,3 : 2SC945(A)(Q,P)
or 2SC2320(E,F)
Q4 : 2SD1266(Q,P)
or 2SC2167(O,Y)
D1~3 : RD13ES(B2) or HZS13N(B2)
D4,19,24~26 : 1SS131 or 1SS178
D5,9~15,17,22 : B30-0431-05
D6~8 : B30-1010-05
D16 : B30-1178-05
D18,23 : B30-0432-05


MC EQ AMP
IC1 (2/2)
IC1 (1/2)
IC2 (2/2)
IC2 (1/2)
CN7
CN9
+B
GND
-B
CN14
CN1
CN3
W14
(X07-2320-82)(A/2) CN12
PRO
LAMP
C.MUTE
H.MUTE
GND
RELAY
K3 ON 12.1V
K3 OFF 0V
MUTE SW BREAK 16.5V
MUTE SW MAKE 6.6V
MUTING
LINE ST.
(X11-2350-81)(E/7)
CN11
CN12
CN13
MUTING RELAY
S7
LOUDNESS
LEVEL
S4
DIGITAL DIRECT
LOCK
VOLUME CONTROL
S6-a
MODE
S6-b
SUBSONIC
BALANCE
S3-a
MUTING
S3-b
LINE STRAIGHT
CD DIRECT ON and LINE STRAIGHT ON 4V
CD DIRECT ON or LINE STRAIGHT ON 2V
DIGITAL DIRECT
W8
W12
TO (X32-1110-00)(A/6) W6
KA-3300D(E)(1/3)
POWER AMPLIFIER
PRE DRIVER PART
(X08)(2/2)

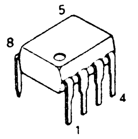
(X08-2180-82)

IC1,2	: NJM5532D-D or NE5532P
IC3	: µPD4027BC
Q1~4	: 2SD786(R,S)
Q5~10, 19~24 45, 46, 47	: 2SC945(A)(Q,P) or 2SC2320(E,F)
Q11,12	: 2SC2003(L,K)
Q13,14,49	: 2SA954 (L,K)
Q15~18	: 2SK371(BL,V) or 2SK369(BL,V)
Q48	: 2SA733(A)(Q,P) or 2SA999(E,F)
D1,2,9,10,21	: RD5.1JS(B2) or HZS 5.1S(B2)
D3,4	MA27W(A)
D15~18,23	: E-272
D22,25	: ISS133 or ISS176
D24	: RD16ES(B2) or HZS16N(B2)

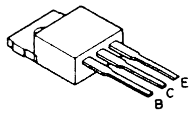
2SA733 (A)
2SA954
2SA999
2SC1845
2SC2003
2SC2320
2SC945 (A)
2SD786



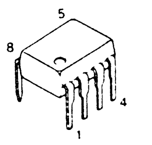
NE5532P



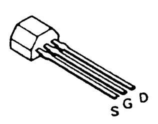
2SC2167
2SD1266



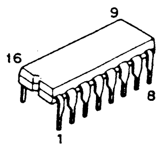
NJM2041D-D
NJM5532D-D



2SK371



µPD4027BC

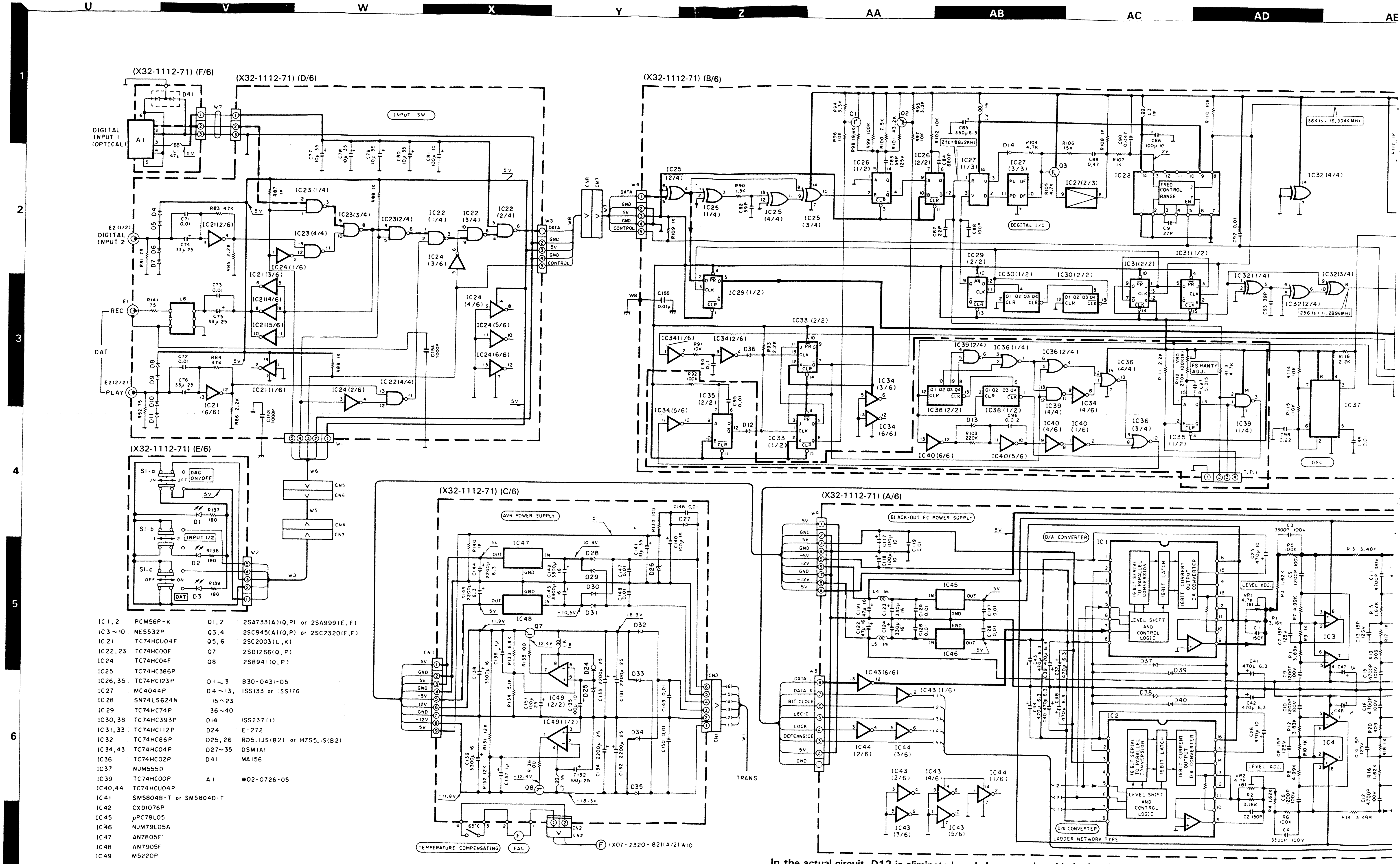


DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

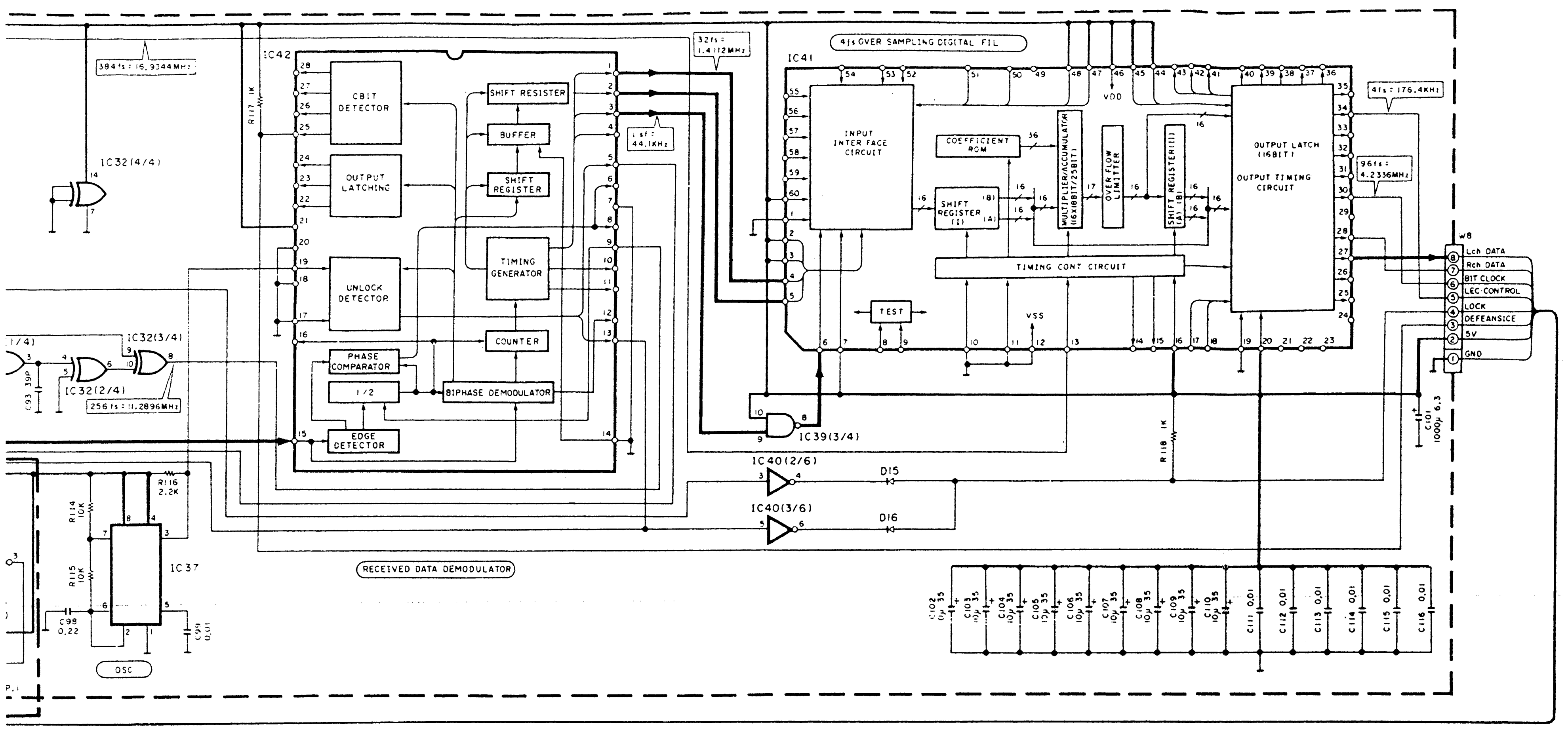
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

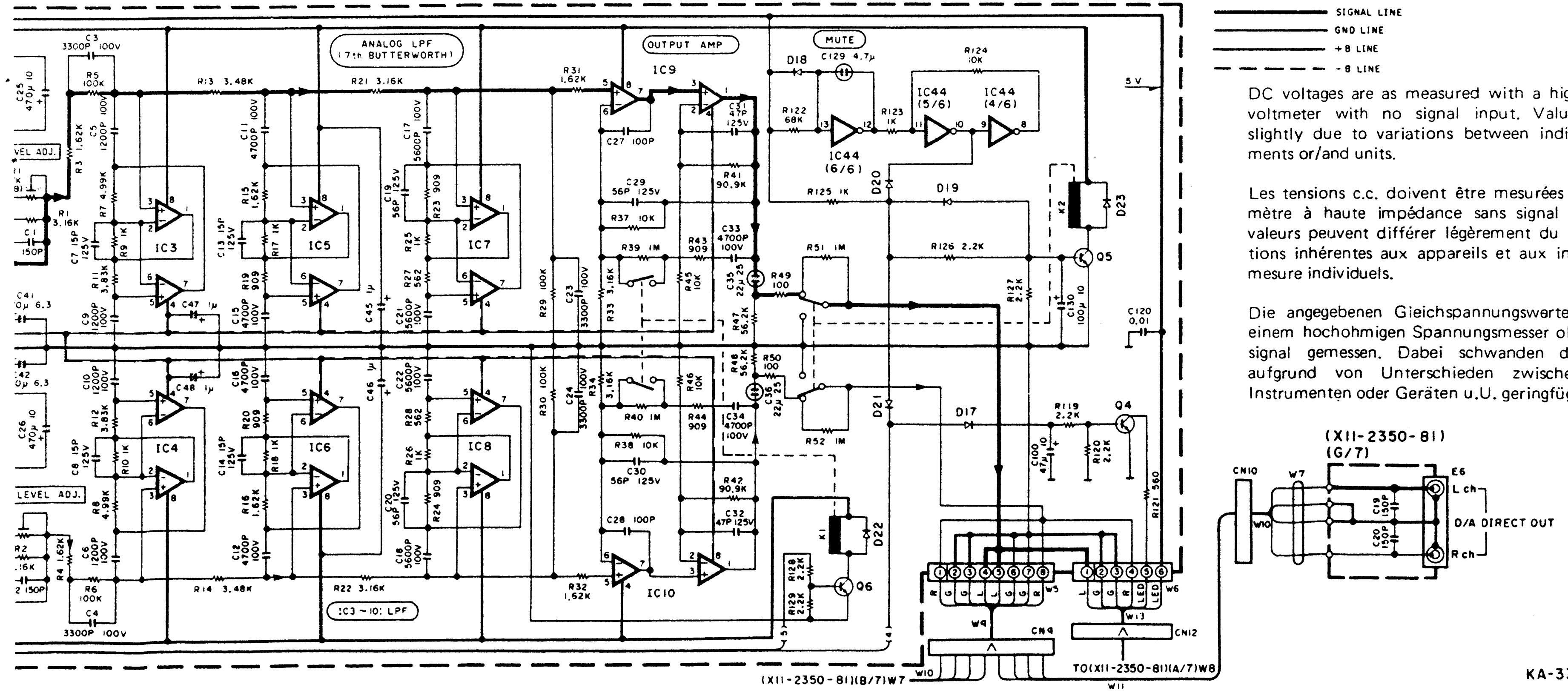

U
V
W
X
Y
Z
AA
AB
AC
AD
1
2
3
4
5
6
7
(X32-1112-71) (F/6)
(X32-1112-71) (D/6)
(X32-1112-71) (B/6)
(X32-1112-71) (E/6)
(X32-1112-71) (C/6)
(X32-1112-71) (A/6)
DIGITAL INPUT 1 (OPTICAL)
DIGITAL INPUT 2
DAT
REC
PLAY
INPUT SW
DIGITAL I/O
384fs : 16.9344MHz
256fs : 11.2896MHz
2fs : 88.2KHz
FREQ CONTROL RANGE
FS HANTY ADJ.
OSC
T.P.
DAC ON/OFF
INPUT 1/2
AVR POWER SUPPLY
BLACK-OUT FC POWER SUPPLY
D/A CONVERTER
16 BIT SERIAL TO PARALLEL CONVERSION
16 BIT LATCH
16 BIT CURRENT OUTPUT DA CONVERTER
LEVEL SHIFT AND CONTROL LOGIC
LEVEL ADJ.
D/A CONVERTER LADDER NETWORK TYPE
TEMPERATURE COMPENSATING
FAN
TRANS
(X07-2320-821(A/2) W10

IC1,2	PCM56P-K	Q1,2	2SA733(A)(Q,P) or 2SA999(E,F)
IC3~10	NE5532P	Q3,4	2SC945(A)(Q,P) or 2SC2320(E,F)
IC21	TC74HCU04F	Q5,6	2SC2003(L,K)
IC22,23	TC74HC00F	Q7	2SD1266(Q,P)
IC24	TC74HC04F	Q8	2SB941(Q,P)
IC25	TC74HC386P		
IC26,35	TC74HC123P	D1~3	B30-0431-05
IC27	MC4044P	D4~13,	ISS133 or ISS176
IC28	SN74LS624N	15~23	
IC29	TC74HC74P	36~40	
IC30,38	TC74HC393P	D14	ISS237(1)
IC31,33	TC74HC112P	D24	E-272
IC32	TC74HC86P	D25,26	RD5.1JS(B2) or HZS5.1S(B2)
IC34,43	TC74HC04P	D27~35	DSM1A1
IC36	TC74HC02P	D41	MA156
IC37	NJM555D		
IC39	TC74HC00P	A1	W02-0726-05
IC40,44	TC74HCU04P		
IC41	SM5804B-T or SM5804D-T		
IC42	CXD1076P		
IC45	μPC78L05		
IC46	NJM79L05A		
IC47	AN7805F		
IC48	AN7905F		
IC49	M5220P		

In the actual circuit, D12 is eliminated, and shown enclosed in broken lines (–·–) in the circuit diagram, is not operating. Then the models with Serial No. 73K00000 and after, the parts boxed with "–·–" are eliminated.


IC42
CBIT DETECTOR
OUTPUT LATCHING
UNLOCK DETECTOR
SHIFT RESISTER
BUFFER
SHIFT REGISTER
TIMING GENERATOR
COUNTER
PHASE COMPARATOR
1/2
BIPHASE DEMODULATOR
EDGE DETECTOR
RECEIVED DATA DEMODULATOR
IC41
4fs OVER SAMPLING DIGITAL FIL
INPUT INTER FACE CIRCUIT
COEFFICIENT ROM
SHIFT REGISTER (A)
TIMING CONT CIRCUIT
TEST
OUTPUT LATCH (16BIT)
OUTPUT TIMING CIRCUIT
OVER FLOW LIMITTER
VDD
VSS
32fs : 1.4112MHz
1fs : 44.1KHz
4fs : 176.4KHz
96fs : 4.2336MHz
384fs : 16.9344MHz
256fs : 11.2896MHz
IC32(4/4)
IC32(3/4)
IC32(2/4)
IC39(3/4)
IC40(2/6)
IC40(3/6)
D15
D16
IC37
OSC
W8
Lch DATA
Rch DATA
BIT CLOCK
LEC CONTROL
LOCK
DEFEANSICE
5V
GND

fs = 44.1 kHz (Major source: CD)


ANALOG LPF (7th BUTTERWORTH)
OUTPUT AMP
MUTE
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC44 (4/6)
IC44 (5/6)
IC44 (6/6)
IC3 ~ 10 : LPF
LEVEL ADJ.
K1
K2
Q4
Q5
Q6
D17
D18
D19
D20
D21
D22
D23
5V
SIGNAL LINE
GND LINE
+B LINE
-B LINE
(X11-2350-81) (G/7)
CN10
W7
W10
E6
Lch
Rch
D/A DIRECT OUT
CN9
CN12
W4
W5
W6
W13
(X11-2350-81)(B/7)W7
TO(X11-2350-81)(A/7)W8
W11

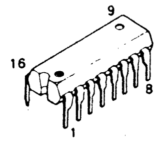
DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

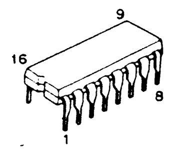
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

KA-3300D (E)(2/3)

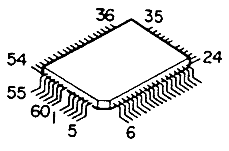
PCM56P-K



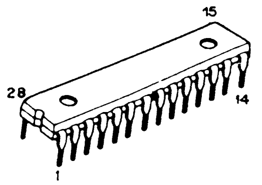
TC74HC112P
TC74HC123P



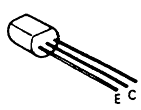
SM5804B-T
SM5804D-T


36
35
54
24
55
60
5
6

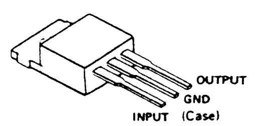
CXD1076P



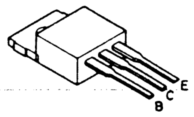
2SA733 (A)
2SA999
2SC2003
2SC2320
2SC945 (A)



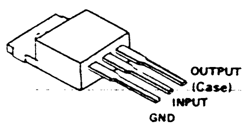
AN7805F


OUTPUT
GND
INPUT (Case)

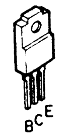
2SD1266



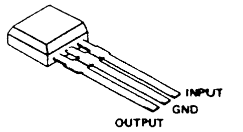
AN7905F


OUTPUT
(Case)
INPUT
GND

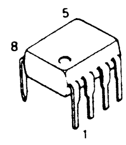
2SB941



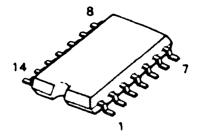
μPC78L05


INPUT
GND
OUTPUT

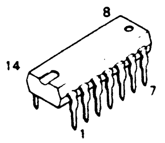
NE5532P
NJM555D



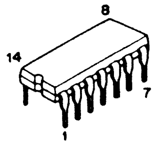
TC74HC00F
TC74HC04F



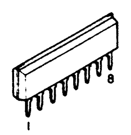
SN74LS624N



MC4044P
TC74HCU04P
TC74HC00P
TC74HC04P
TC74HC386P
TC74HC393P
TC74HC74P
TC74HC86P



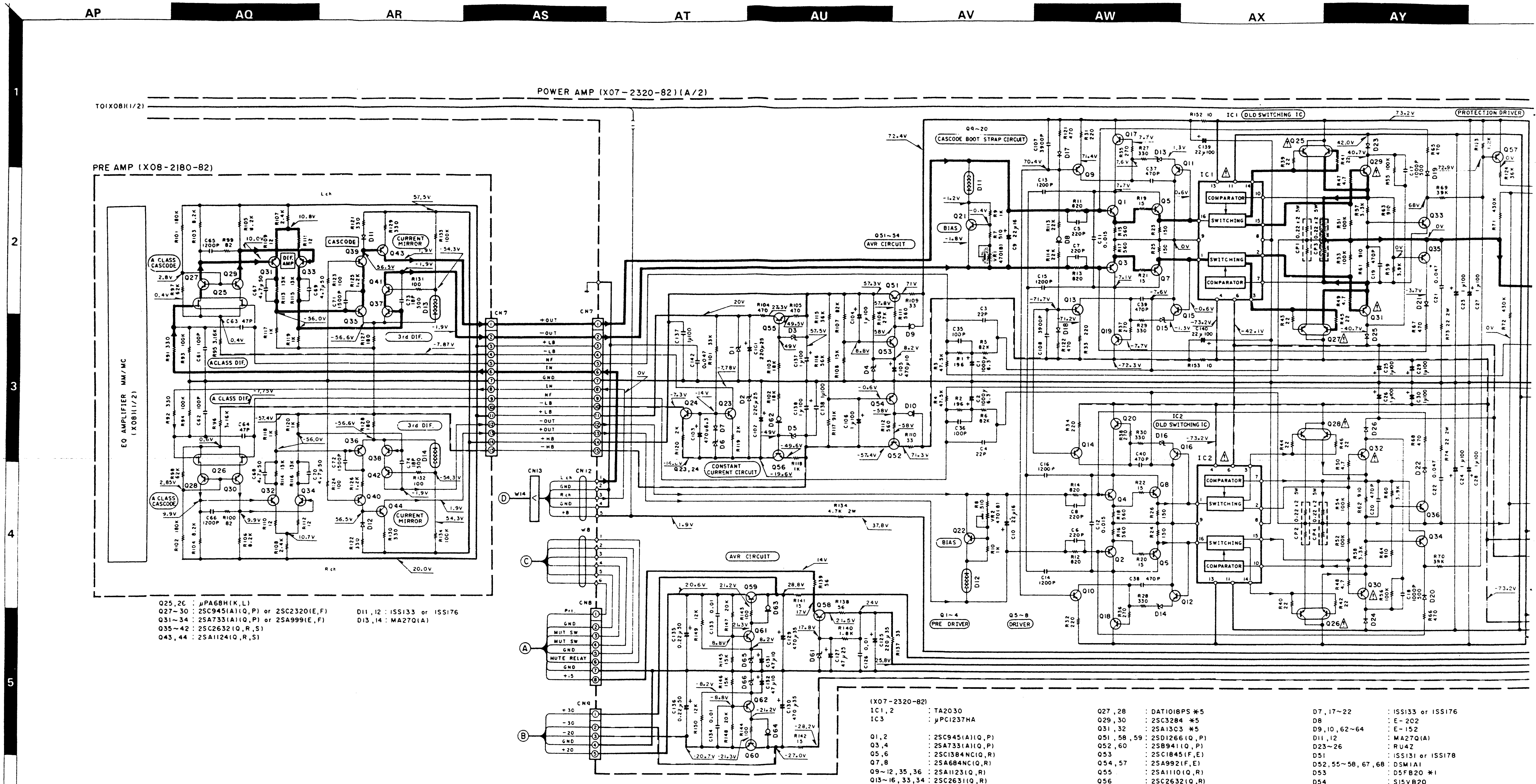
μPC1237HA



CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

KA-3300D

KENWOOD


AP
AQ
AR
AS
AT
AU
AV
AW
AX
AY
1
2
3
4
5
6
7
POWER AMP (X07-2320-82)(A/2)
TO(X08)(1/2)
PRE AMP (X08-2180-82)
EQ AMPLIFIER MM/MC (X08)(1/2)
L ch
R ch
A CLASS CASCODE
ACLASS DIF.
A CLASS DIF.
DIF. AMP
CASCODE
CURRENT MIRROR
3rd DIF.
CN7
CN12
CN13
CN8
CN9
W14
W8
+OUT
-OUT
+LB
-LB
NF
IN
GND
+HB
-HB
Prt.
MUT SW
MUTE RELAY
+5
+30
-30
-20
+20
CONSTANT CURRENT CIRCUIT
AVR CIRCUIT
CASCODE BOOT STRAP CIRCUIT
Q9~20
Q51~54
BIAS
IC1 (DLD SWITCHING IC)
IC2 (DLD SWITCHING IC)
COMPARATOR
SWITCHING
PROTECTION DRIVER
PRE DRIVER
Q1~4
DRIVER
Q5~8
A
B
C
D

Q25,26 : μPA68H(K,L)
Q27~30 : 2SC945(A)(Q,P) or 2SC2320(E,F)
Q31~34 : 2SA733(A)(Q,P) or 2SA999(E,F)
Q35~42 : 2SC2632(Q,R,S)
Q43,44 : 2SA1124(Q,R,S)

D11,12 : 1SS133 or 1SS176
D13,14 : MA27Q(A)

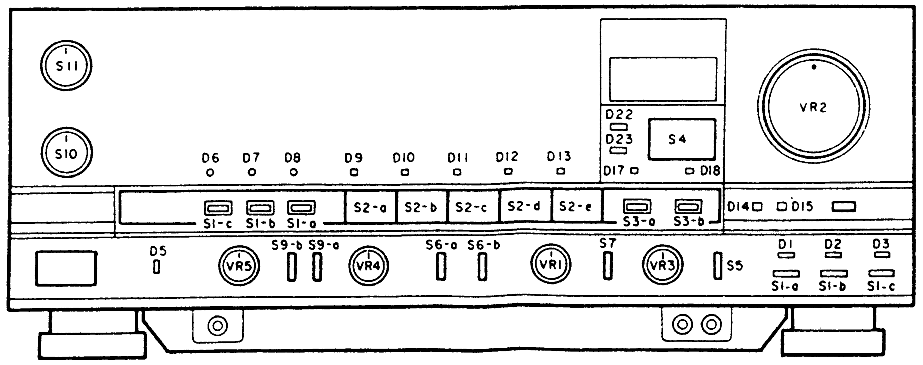
(X07-2320-82)
IC1,2 : TA2030
IC3 : μPC1237HA

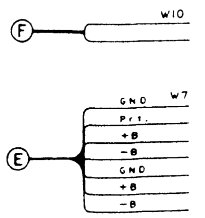
Q1,2 : 2SC945(A)(Q,P)
Q3,4 : 2SA733(A)(Q,P)
Q5,6 : 2SC1384NC(Q,R)
Q7,8 : 2SA684NC(Q,R)
Q9~12,35,36 : 2SA1123(Q,R)
Q13~16,33,34 : 2SC2631(Q,R)
Q17,18 : 2SC3944A(Q,R)
Q19,20 : 2SA1535A(Q,R)
Q21,22 : 2SC3419(Y)
Q23,24,61 : 2SC945(A)(Q,P) or 2SC2320(E,F)
Q25,26 : DAT1018NS *5

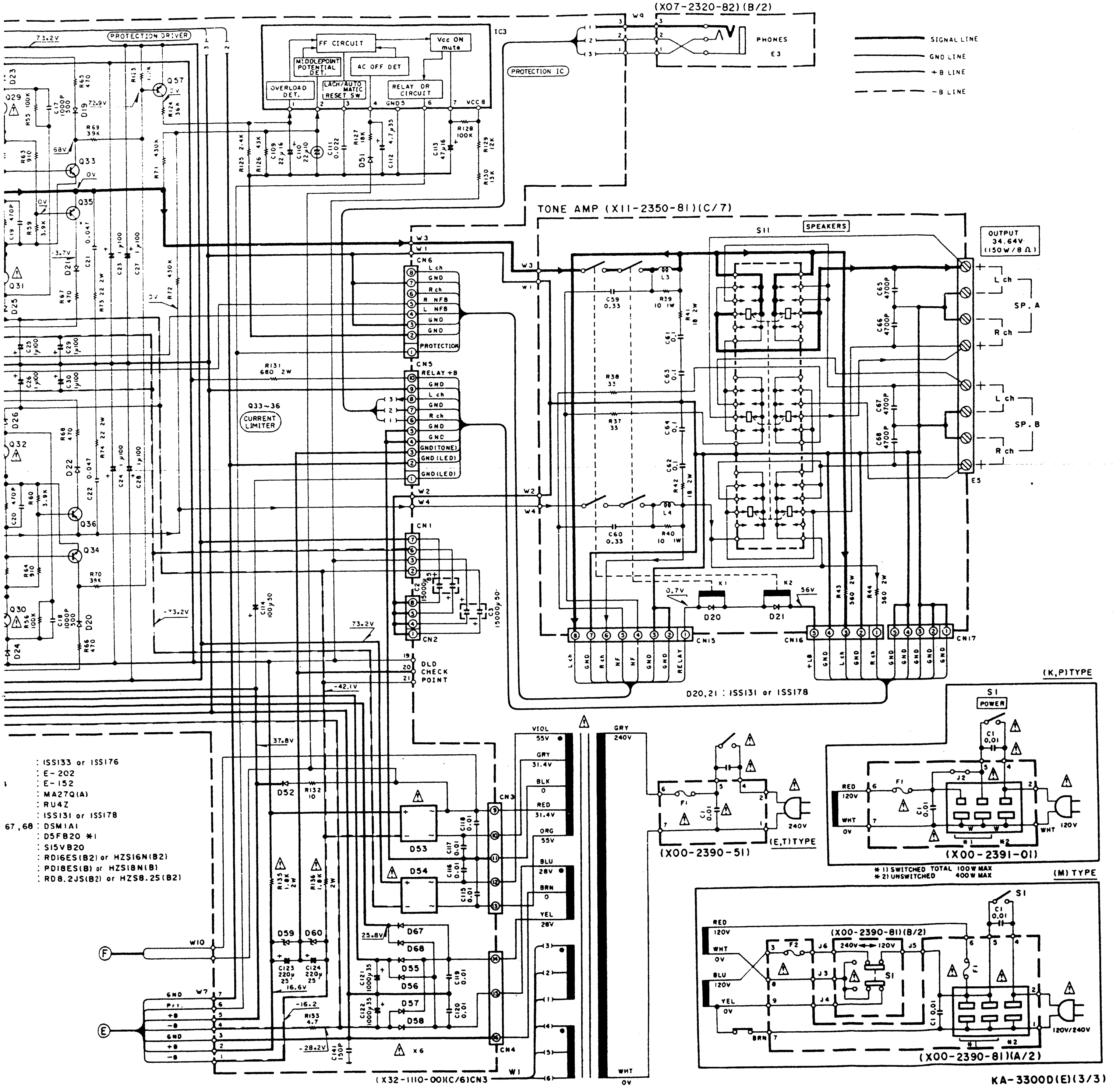
Q27,28 : DAT1018PS *5
Q29,30 : 2SC3284 *5
Q31,32 : 2SA1303 *5
Q51,58,59 : 2SD1266(Q,P)
Q52,60 : 2SB941(Q,P)
Q53 : 2SC1845(F,E)
Q54,57 : 2SA992(F,E)
Q55 : 2SA1110(Q,R)
Q56 : 2SC2632(Q,R)
Q62 : 2SA733(A)(Q,P) or 2SA999(E,F)

D1,2 : RD20JS(B) or HZS20S(B)
D3~5 : RD8.2JS(B2) or HZS8.2S(B2)
D6,13~16 : RD5.1JS(B2) or HZS5.1S(B2)

D7,17~22 : 1SS133 or 1SS176
D8 : E-202
D9,10,62~64 : E-152
D11,12 : MA27Q(A)
D23~26 : RU4Z
D51 : 1SS131 or 1SS178
D52,55~58,67,68 : DSM1A1
D53 : D5FB20 *1
D54 : S15VB20
D59,60 : RD16ES(B2) or HZS16N(B2)
D61 : RD18ES(B) or HZS18N(B)
D65,66 : RD8.2JS(B2) or HZS8.2S(B2)

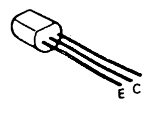

S11
S10
D6
D7
D8
D9
D10
D11
D12
D13
D22
D23
D17
D18
S4
VR2
S1-c
S1-b
S1-a
S2-a
S2-b
S2-c
S2-d
S2-e
S3-a
S3-b
D14
D15
D5
VR5
S9-b
S9-a
VR4
S6-a
S6-b
VR1
S7
VR3
S5
D1
D2
D3
S1-a
S1-b
S1-c


W10
F
W7
GND
Prt.
+B
-B
GND
+B
-B
E

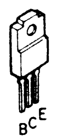

(X07-2320-82)(B/2)
PHONES
E3
W9
IC3
FF CIRCUIT
Vcc ON mute
MIDDLEPOINT POTENTIAL DET.
AC OFF DET
OVERLOAD DET.
LACH/AUTO MATIC RESET SW
RELAY DR CIRCUIT
GND
VCC
(PROTECTION IC)
PROTECTION DRIVER
73.2V
Q29
Q31
Q32
Q33
Q34
Q35
Q36
Q30
Q57
Q33~36 (CURRENT LIMITER)
R131 680 2W
TONE AMP (X11-2350-81)(C/7)
S11
SPEAKERS
OUTPUT 34.64V (150W/8Ω)
L ch
R ch
SP. A
SP. B
E5
CN6
CN5
CN1
CN2
CN15
CN16
CN17
PROTECTION
RELAY +B
GND(TONE)
GND(LED)
W1
W2
W3
W4
L3
L4
K1
K2
D20
D21
0.7V
56V
D20,21 : ISS131 or ISS178
DLD CHECK POINT
-42.1V
-73.2V
37.8V
(K,P)TYPE
S1
POWER
(X00-2390-51)
(E,T)TYPE
(X00-2391-01)
*1) SWITCHED TOTAL 100W MAX
*2) UNSWITCHED 400W MAX
(M) TYPE
(X00-2390-81)(B/2)
(X00-2390-81)(A/2)
120V
240V
120V/240V
RED
WHT
BLU
YEL
BRN
OV
VIOL 55V
GRY 31.4V
BLK 0
RED 31.4V
ORG 55V
BLU 28V
BRN 0
YEL 28V
GRY 240V
WHT 0V
D52
D53
D54
D55
D56
D57
D58
D59
D60
D67
D68
CN3
CN4
W7
W10
F
E
GND
Pri
+B
-B
-16.2
-28.2V
16.6V
25.8V
(X32-1110-00)(C/6)CN3
: ISS133 or ISS176
: E-202
: E-152
: MA27Q(A)
: RU4Z
: ISS131 or ISS178
67,68 : DSM1A1
: D5FB20 *1
: S15VB20
: RD16ES(B2) or HZS16N(B2)
: PD18ES(B) or HZS18N(B)
: RD8.2JS(B2) or HZS8.2S(B2)
SIGNAL LINE
GND LINE
+B LINE
-B LINE

KA-3300D(E)(3/3)

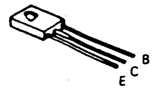
2SA1123
2SA1124
2SA684NC
2SA733 (A)
2SA992
2SA999
2SC1384NC
2SC1845
2SC2320
2SC2631
2SC2632
2SC945 (A)



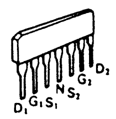
2SA1535A
2SB941
2SC3944A



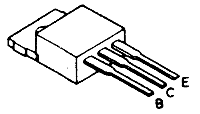
2SA1110



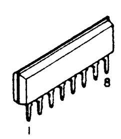
µPA68H


D₁ G₁ S₁ N S₂ G₂ D₂

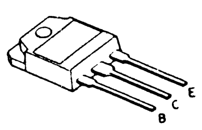
2SD1266



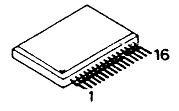
µPC1237HA



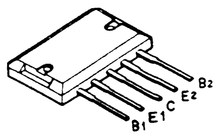
2SA1303＊5
2SC3284＊5



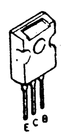
TA2030



DAT1018NS＊5
DAT1018PS＊5



2SC3419



DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

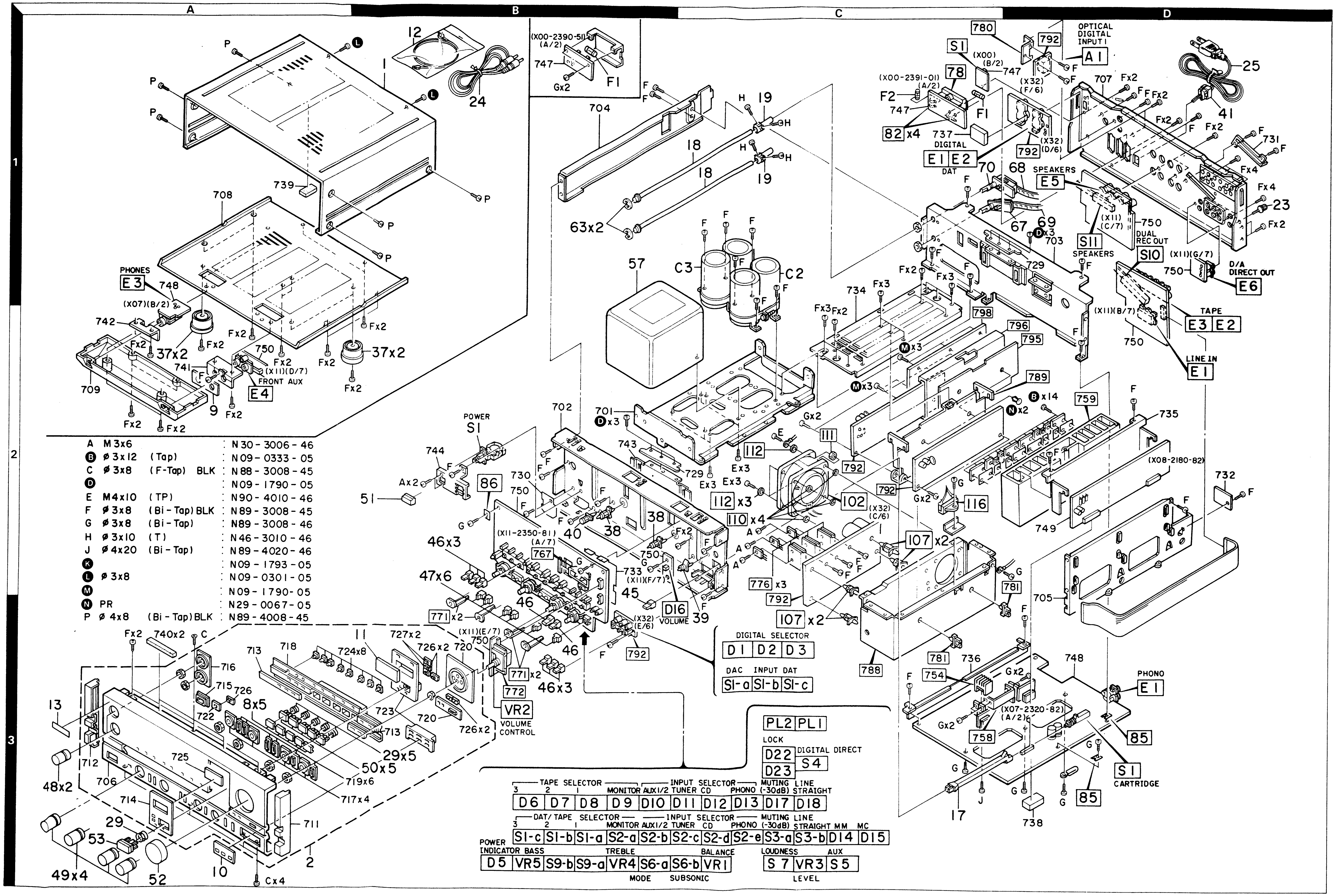
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

KA-3300D

KENWOOD

KA-3300D KA-3300D

EXPLODED VIEW


A
B
C
D
1
2
3
12
1
24
P
739
708
PHONES
E3
748
(X07)(B/2)
742
37x2
Fx2
750
741
(X11)(D/7)
FRONT AUX
E4
9
709
(X00-2390-51)
(A/2)
747
Gx2
F1
704
H
19
18
63x2
57
C3
C2
702
701
743
729
POWER
S1
744
Ax2
51
730
86
750
40
38
(X11-2350-81)
(A/7)
767
46x3
47x6
46
45
733
(X11)(F/7)
D16
VOLUME
39
771 x2
772
VR2
VOLUME CONTROL
(X11)(E/7)
(X32)
(E/6)
792
DIGITAL SELECTOR
D1 D2 D3
DAC INPUT DAT
S1-a S1-b S1-c
740x2
716
713
718
724x8
11
727x2
726x2
720
715
726
8x5
722
723
713
29x5
50x5
719x6
717x4
725
706
712
714
711
13
48x2
29
53
49x4
52
10
Cx4
2
PL2 PL1
LOCK
D22 D23
DIGITAL DIRECT
S4
TAPE SELECTOR
3 2 1 MONITOR
AUX1/2 TUNER CD
INPUT SELECTOR
PHONO
MUTING (-30dB)
LINE STRAIGHT
D6 D7 D8 D9 D10 D11 D12 D13 D17 D18
DAT/TAPE SELECTOR
3 2 1 MONITOR AUX1/2 TUNER CD PHONO (-30dB) STRAIGHT MM MC
POWER INDICATOR
S1-c S1-b S1-a S2-a S2-b S2-c S2-d S2-e S3-a S3-b D14 D15
BASS TREBLE BALANCE
D5 VR5 S9-b S9-a VR4 S6-a S6-b VR1
MODE SUBSONIC
LOUDNESS AUX
S7 VR3 S5
LEVEL
734
Fx3
798
796
795
789
759
735
B x14
N x2
M x3
111
112
112 x3
110 x4
Ex3
E
102
(X32)
(C/6)
107 x2
116
776 x3
792
107 x2
788
781
(X08-2180-82)
732
749
705
780
S1
(X00)
(B/2)
747
78
OPTICAL DIGITAL INPUT 1
A1
(X32)
(F/6)
(X00-2391-01)
(A/2)
F2
747
82 x4
737
DIGITAL
E1 E2
DAT
F1
792
(D/6)
707
25
41
731
Fx4
23
70
68
SPEAKERS
E5
67
69
D x3
703
(X11)
(C/7)
S11
SPEAKERS
750
DUAL REC OUT
S10
(X11)(G/7)
D/A DIRECT OUT
E6
(X11)(B/7)
TAPE
E3 E2
LINE IN
E1
750
781
736
754
Gx2
748
PHONO
E1
(X07-2320-82)
(A/2)
758
85
S1
CARTRIDGE
17
J
738

A	M3x6			: N30-3006-46
B	ø3x12	(Tap)		: N09-0333-05
C	ø3x8	(F-Tap)	BLK	: N88-3008-45
D				: N09-1790-05
E	M4x10	(TP)		: N90-4010-46
F	ø3x8	(Bi-Tap)	BLK	: N89-3008-45
G	ø3x8	(Bi-Tap)		: N89-3008-46
H	ø3x10	(T)		: N46-3010-46
J	ø4x20	(Bi-Tap)		: N89-4020-46
K				: N09-1793-05
L	ø3x8			: N09-0301-05
M				: N09-1790-05
N	PR			: N29-0067-05
P	ø4x8	(Bi-Tap)	BLK	: N89-4008-45

Parts with the exploded numbers larger than 700 are not supplied.

KA-3300D KA-3300D

PARTS LIST

⁎ New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

KA-3300D

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
1	1B		A01-1502-01	METALLIC CABINET	TE	
1	1B		A01-1506-01	METALLIC CABINET	KPM	
2	3A	*	A20-5126-02	PANEL ASSY		
8	3A		B03-1950-04	DRESSING PLATE (KNOB)		
9	2A		B03-2132-04	DRESSING PLATE (FR AUX)		
10	3A	*	B03-2176-04	DRESSING PLATE (DIGITAL)		
11	3B		B19-0529-04	LIGHTING BOARD		
12	1B	*	B19-0531-05	OPTICAL FIBER ASSY		
13	3A	*	B43-0278-04	KENWOOD BADGE		
-			B46-0092-03	WARRANTY CARD	K	
-			B46-0121-03	WARRANTY CARD	P	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0143-03	WARRANTY CARD	T	
-		*	B50-6564-00	INSTRUCTION MANUAL(ENGLISH)		
-		*	B50-6565-00	INSTRUCTION MANUAL(FRENCH)	PME	
-		*	B50-6566-00	INSTRUCTION MANUAL(SPANISH)	M	
-		*	B50-6567-00	INSTRUCTION MANUAL(G,D,I)	E	
-			B58-0269-04	CAUTION CARD	K	
-			B58-0803-03	CAUTION CARD	E	
⚠ C1			C91-0023-05	CERAMIC 0.01UF AC250V	M	
⚠ C1			C91-0647-05	CERAMIC 0.01UF P	KPTE	
C2	1C	*	C90-1468-05	ELECTRO 18000UF 85WV		
C3	1C	*	C90-1470-05	ELECTRO 18000UF 56WV		
17	3C		D21-1103-03	EXTENSION SHAFT(CARTRIDGE)		
18	1C		D21-1107-34	EXTENSION SHAFT		
19	1C		D22-0047-04	SHAFT COUPLING		
23	1D		E21-0006-25	BINDING POST (GND)		
24	1B		E30-1427-05	AUDIO CORD		
⚠ 25	1D		E30-0459-05	AC POWER CORD	E	
⚠ 25	1D		E30-0812-05	AC POWER CORD	M	
⚠ 25	1D		E30-0974-05	AC POWER CORD	KP	
⚠ 25	1D		E30-1416-05	AC POWER CORD	T	
⚠ F1	1C		F05-4025-05	FUSE (SEMKO) (250V T4A)	TE	
⚠ F1	1C		F05-8029-05	FUSE (UL) (250V 8A)	KP	
⚠ F1 ,2	1C		F05-4022-05	FUSE (250V 4A)	M	
29	3A,3B		G01-1751-04	COMPRESSION SPRING(KNOB)		
-		*	H01-7420-04	ITEM CARTON CASE		
-			H10-3339-02	POLYSTYRENE FOAMED FIXTURE(F)		
-			H10-3340-02	POLYSTYRENE FOAMED FIXTURE(R)		
-			H25-0232-04	PROTECTION BAG (235X350X0.03)		
-			H25-0274-04	PROTECTION BAG (900X500X0.05)		
37	2A,2B		J02-0182-15	FOOT		
38	2B		J19-0515-05	UNIT HOLDER (H=14.6)		
39	3C		J19-0586-05	UNIT HOLDER (H=6.7)		
40	2B		J19-2536-05	UNIT HOLDER		
⚠ 41	1D		J42-0083-05	POWER CORD BUSHING		
-			J61-0307-05	WIRE BAND		
45	2B		K27-1396-04	KNOB (BUTTON) CARTRIDGE		
46	2B,3B		K29-1980-04	KNOB ASSY(BUTTON)TAPE,DIGITAL		

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47	2B		K29-2243-04	KNOB ASSY(BUTTON)BASS,TREBLE		
48	3A		K29-2303-04	KNOB (SPEAKERS,DUAL REC OUT)		
49	3A		K29-2305-04	KNOB (TONE)		
50	3B		K29-2307-04	KNOB (BUTTON) INPUT SELECTOR		
51	2B		K29-2432-03	KNOB ASSY(BUTTON)POWER		
52	3A		K29-2510-04	KNOB ASSY(CAP)VOLULME CONTROL		
53	3A	*	K29-2585-04	KNOB ASSY(BOTTON)DIGITAL DIR		
⚠ 57	1B	*	L01-7541-05	POWER TRANSFORMER	KP	
⚠ 57	1B	*	L01-7542-05	POWER TRANSFORMER	E	
⚠ 57	1B	*	L01-7545-05	POWER TRANSFORMER	M	
⚠ 57	1B	*	L01-7547-05	POWER TRANSFORMER	T	
-		*	L92-0019-05	FERRITE CORE		
63	1B		N10-2090-46	HEXAGON NUT (M9)		
D	2B,1D	*	N09-1790-05	MACHINE SCREW		
L	1B		N09-0301-05	TAPTITE SCREW (Ø3X8)		
67	1D		S90-0093-05	REMOTE SWITCH SHAFT(REC OUT)		
68	1D		S90-0094-05	REMOTE WIRE (SPEAKERS)		
69	1D		S90-0095-05	REMOTE WIRE (DUAL REC OUT)		
70	1C		S90-0100-05	REMOTE SWITCH SHAFT(SPEAKERS)		
⚠ -			S59-1055-05	THERMAL SWITCH	MTE	
-			S59-1056-05	THERMAL SWITCH	KP	
S1	2B		S40-1094-05	PUSH SWITCH (POWER TYPE)		

POWER SUPPLY UNIT (X00-2390-51)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
⚠ C1			C91-0023-05	CERAMIC 0.01UF AC250V	M	
⚠ C1			C91-0647-05	CERAMIC 0.01UF P	KPTE	
⚠ 78	1C	*	E03-0077-05	AC OUTLET	M	
⚠ 78	1C	*	E03-0078-05	AC OUTLET	KP	
82	1C		J13-0041-05	FUSE CLIP	KPM	
82	1C		J13-0054-05	FUSE CLIP	TE	
⚠ S1			S31-2083-05	SLIDE SWITCH (POWER TYPE)	M	

POWER AMPLIFIER UNIT (X07-2320-82)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C1 ,2			CE04KW0J102M	ELECTRO 1000UF 6.3WV		
C3 ,4			CC45FSL1H220J	CERAMIC 22PF J		
C5 -8			C91-0749-05	CERAMIC 220PF K		
C9 ,10			CE04KW1C220M	ELECTRO 22UF 16WV		
C11 ,12			CF92FV1H153J	MF 0.015UF J		
C13 ,14			CF92FV1H122J	MF 1200PF J		
C15		*	CF92FV1H122J	MF 1200PF J		
C16			CF92FV1H122J	MF 1200PF J		
C17 ,18			CK45FB2H102K	CERAMIC 1000PF K		
C19 ,20			CK45FB1H471K	CERAMIC 470PF K		
C21 ,22			CF92FV1H473J	MF 0.047UF J		
C23 -30			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C33 ,34			C91-0747-05	CERAMIC 150PF K		
C35 ,36			CC45FSL1H101J	CERAMIC 100PF J		
C37			C91-0753-05	CHIP C 470PF K		
C38 -40			C91-0753-05	CHIP C 470PF K		
C101,102			CE04KW1E221M	ELECTRO 220UF 25WV		
C103			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C104			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C105			CE04KW1A471M	ELECTRO 470UF 10WV		

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C106			CE04KW2A010M	ELECTRO 1.0UF 100WV		
C107			CF92FV1H392J	MF 3900PF J		
C108			CF92FV1H392J	MF 3900PF J		
C109			CE04KW1C220M	ELECTRO 22UF 16WV		
C110			C90-1333-05	NP-ELEC 22UF 10WV		
C111			CF92FV1H223J	MF 0.022UF J		
C112			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C113			CE04KW1C470M	ELECTRO 47UF 16WV		
C114			CE04KW1H101M	ELECTRO 100UF 50WV		
C115-120			CK45FE2H103P	CERAMIC 0.010UF P		
C121,122			CE04KW1V102M	ELECTRO 1000UF 35WV		
C123,124			CE04KW1E221M	ELECTRO 220UF 25WV		
C125			CE04KW1V221M	ELECTRO 220UF 35WV		
C126			CF92FV1H103J	MF 0.010UF J		
C127			CE04KW1E470M	ELECTRO 47UF 25WV		
C128			CK45FB1H102K	CERAMIC 1000PF K		
C129,130			CE04KW1V471M	ELECTRO 470UF 35WV		
C131,132			CE04KW1A470M	ELECTRO 47UF 10WV		
C133,134			CF92FV1H103J	MF 0.010UF J		
C135,136			CE04KW1HR22M	ELECTRO 0.22UF 50WV		
C137,138			C91-0033-05	MF 1UF 100V		
C139,140			CE04KW2A220M	ELECTRO 22UF 100WV		
C141			CC45SL1H151J	CERAMIC 150PF J		
C142			CK45F1H473Z	CERAMIC 0.047UF Z		
85	3D		E23-0125-05	TERMINAL		
E1	3D	*	E13-0236-05	PHONO JACK (2P)		
E3	1A	*	E11-0170-05	PHONE JACK		
L1 ,2			L40-1011-47	SMALL FIXED INDUCTOR(100UH,K)		
B	2D		N09-0333-05	TAPPING SCREW (Ø3X12)TR		
CP1 -4			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R1 ,2			RN14BK2C1960FTS	RN 196.0 F 1/6W		
R3 ,4			RN14BK2C4752FTS	RN 47.5K F 1/6W		
R11 -14			RD14AB2E821J	FL-PROOF RD 820 J 1/4W		
R15 -18			RD14AB2E561J	FL-PROOF RD 560 J 1/4W		
R19 -22			RD14AB2E150J	FL-PROOF RD 15 J 1/4W		
R23 -26			RD14AB2E151J	FL-PROOF RD 150 J 1/4W		
R27 -30			RD14AB2E331J	FL-PROOF RD 330 J 1/4W		
R31 -34			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R35 -38			RD14AB2E271J	FL-PROOF RD 270 J 1/4W		
R39 -46			RD14AB2E220J	FL-PROOF RD 22 J 1/4W		
R47 -50			RD14AB2E4R7J	FL-PROOF RD 4.7 J 1/4W		
R61 -64			RD14AB2E911J	FL-PROOF RD 910 J 1/4W		
R65 -68			RD14AB2E471J	FL-PROOF RD 470 J 1/4W		
R73 ,74			RS14DB3D220JTE	FL-PROOF RS 22 J 2W		
R81 ,82			RN14BK2C4752FTS	RN 47.5K F 1/6W		
R83 ,84		*	RN14BK2C5620FTS	RN 562.0 F 1/6W		
R104,105			RD14AB2E471J	FL-PROOF RD 470 J 1/4W		
R109,110			RD14AB2E330J	FL-PROOF RD 33 J 1/4W		
R111,112			RD14AB2E561J	FL-PROOF RD 560 J 1/4W		
R118			RD14AB2E102J	FL-PROOF RD 1.0K J 1/4W		
R121,122			RD14AB2E471J	FL-PROOF RD 470 J 1/4W		
R131		*	RS14DB3D681JTE	FL-PROOF RS 680 J 2W		
R132			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		

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R133			RD14AB2E4R7J	FL-PROOF RD 4.7 J 1/4W		
R134		⁎	RS14DB3D472JTE	FL-PROOF RS 4.7K J 2W		
R135,136			RS14DB3D182JTE	FL-PROOF RS 1.8K J 2W		
R137			RD14AB2E330J	FL-PROOF RD 33 J 1/4W		
R138,139			RD14AB2E560J	FL-PROOF RD 56 J 1/4W		
R141,142			RD14AB2E150J	FL-PROOF RD 15 J 1/4W		
R143,144			RD14AB2E101J	FL-PROOF RD 100 J 1/4W		
R152,153			RD14AB2E100J	FL-PROOF RD 10 J 1/4W		
VR1 ,2			R12-0094-05	TRIMMING POT.(470)BIAS		
S1	3D		S40-6027-05	PUSH SWITCH (CARTRIDGE)		
D1 ,2		⁎	HZS20S(B)	ZENER DIODE		
D1 ,2			RD20JS(B)	ZENER DIODE		
D3 -5		⁎	HZS8.2S(B2)	ZENER DIODE		
D3 -5			RD8.2JS(B2)	ZENER DIODE		
D6			HZS5.1S(B2)	ZENER DIODE		
D6			RD5.1JS(B2)	ZENER DIODE		
D7			1SS133	DIODE		
D7			1SS176	DIODE		
D8			E-202	CONSTANT CURRENT DIODE		
D9 ,10			E-152	CONSTANT CURRENT DIODE		
D11 ,12			MA27Q(A)	VARISTOR		
D13 -16			HZS5.1S(B2)	ZENER DIODE		
D13 -16			RD5.1JS(B2)	ZENER DIODE		
D17 -22			1SS133	DIODE		
D17 -22			1SS176	DIODE		
D23 -26			RU4Z	DIODE		
D51			1SS131	DIODE		
D51			1SS178	DIODE		
D52			DSM1A1	DIODE		
D53			D5FB20⁎1	DIODE		
D54			S15VB20	DIODE		
D55 -58			DSM1A1	DIODE		
D59 ,60			HZS16N(B2)	ZENER DIODE		
D59 ,60			RD16ES(B2)	ZENER DIODE		
D61			HZS18N(B)	ZENER DIODE		
D61			RD18ES(B)	ZENER DIODE		
D62 -64			E-152	CONSTANT CURRENT DIODE		
D65 ,66		⁎	HZS8.2S(B2)	ZENER DIODE		
D65 ,66			RD8.2JS(B2)	ZENER DIODE		
D67 ,68			DSM1A1	DIODE		
IC1 ,2			TA2030	IC(LO/HI SWITCHING)		
IC3			UPC1237HA	IC(POWER AMP)		
Q1 ,2			2SC945(A)(Q,P)	TRANSISTOR		
Q3 ,4			2SA733(A)(Q,P)	TRANSISTOR		
Q5 ,6			2SC1384NC(Q,R)	TRANSISTOR		
Q7 ,8			2SA684NC(Q,R)	TRANSISTOR		
Q9 -12			2SA1123(Q,R)	TRANSISTOR		
Q13 -16			2SC2631(Q,R)	TRANSISTOR		
Q17 ,18		⁎	2SC3944A(Q)	TRANSISTOR		
Q17 ,18		⁎	2SC3944A(R)	TRANSISTOR		
Q19 ,20		⁎	2SA1535A(Q)	TRANSISTOR		
Q19 ,20		⁎	2SA1535A(R)	TRANSISTOR		
Q21 ,22			2SC3419(Y)	TRANSISTOR		
Q23 ,24			2SC2320(E,F)	TRANSISTOR		

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Q23 ,24			2SC945(A)(Q,P)	TRANSISTOR		
Q25 ,26		⁎	DAT1018NS⁎5	TRANSISTOR		
Q27 ,28		⁎	DAT1018PS⁎5	TRANSISTOR		
Q29 ,30			2SC3284⁎5	TRANSISTOR		
Q31 ,32			2SA1303⁎5	TRANSISTOR		
Q33 ,34			2SC2631(Q,R)	TRANSISTOR		
Q35 ,36			2SA1123(Q,R)	TRANSISTOR		
Q51			2SD1266(Q,P)	TRANSISTOR		
Q52		⁎	2SB941(Q,P)	TRANSISTOR		
Q53			2SC1845(F,E)	TRANSISTOR		
Q54			2SA992(F,E)	TRANSISTOR		
Q55			2SA1110(Q,R)	TRANSISTOR		
Q56			2SC2632(Q,R)	TRANSISTOR		
Q57			2SA992(F,E)	TRANSISTOR		
Q58 ,59			2SD1266(Q,P)	TRANSISTOR		
Q60		⁎	2SB941(Q,P)	TRANSISTOR		
Q61			2SC2320(E,F)	TRANSISTOR		
Q61			2SC945(A)(Q,P)	TRANSISTOR		
Q62			2SA733(A)(Q,P)	TRANSISTOR		
Q62			2SA999(E,F)	TRANSISTOR		
PRE AMPLIFIER UNIT (X08-2180-82)						
C1 ,2			CE04KW0J331M	ELECTRO 330UF 6.3WV		
C3 ,4			CK45FB1H152K	CERAMIC 1500PF K		
C5 ,6			CK45FB1H222K	CERAMIC 2200PF K		
C7 ,8			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C9 ,10			CK45FB1H222K	CERAMIC 2200PF K		
C11 ,12			CE04KW1A101M	ELECTRO 100UF 10WV		
C13 ,14			CQ93HP2A683G	MYLAR 0.068UF G		
C17 ,18			CQ93HP2A203G	MYLAR 0.020UF G		
C19 ,20			CE04KW0J102M	ELECTRO 1000UF 6.3WV		
C21 ,22			CK45FB1H102K	CERAMIC 1000PF K		
C23 ,24			CE04KW1A101M	ELECTRO 100UF 10WV		
C25 ,26			C90-1332-05	NP-ELEC 10UF 16WV		
C27 ,28			CF92FV1H392J	MF 3900PF J		
C33 ,34			CC45FSL1H101J	CERAMIC 100PF J		
C35 ,36			CK45FB1H152K	CERAMIC 1500PF K		
C37 ,38			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C39 ,40			CE04KW0J102M	ELECTRO 1000UF 6.3WV		
C41 ,42			CQ93HP2A683G	MYLAR 0.068UF G		
C43 ,44			CQ93HP2A203G	MYLAR 0.020UF G		
C45 ,46			C90-1332-05	NP-ELEC 10UF 16WV		
C47 ,48			CF92FV1H392J	MF 3900PF J		
C61 ,62			CC45FSL1H101J	CERAMIC 100PF J		
C63 ,64			CC45FSL1H470J	CERAMIC 47PF J		
C65 ,66			CF92FV1H122J	MF 1200PF J		
C67 -70			C90-1335-05	NP-ELEC 4.7UF 50WV		
C71 ,72			CK45FB1H152K	CERAMIC 1500PF K		
C73 ,74		⁎	CC45FSL2H180J	CERAMIC 18PF J		
C81			CE04KW0J471M	ELECTRO 470UF 6.3WV		
C82			CE04KW1E101M	ELECTRO 100UF 25WV		
C83 ,84			CF92FV1H103J	MF 0.010UF J		
C85			CF92FV1H224J	MF 0.22UF J		
C86			CE04KW1C220M	ELECTRO 22UF 16WV		
C87			CK45FF1H103Z	CERAMIC 0.010UF Z		
C88			CK45FB1H152K	CERAMIC 1500PF K		

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C89			CK45FB1H222K	CERAMIC 2200PF K		
C90			CK45FF1H103Z	CERAMIC 0.010UF Z		
C91			CE04KW1V100M	ELECTRO 10UF 35WV		
C92 -95			CF92FV1H103J	MF 0.010UF J		
R21 ,22		⁎	RN14BK2C5112FTS	RN 51.1K F 1/6W		
R23 ,24		⁎	RN14BK2C3831FTS	RN 3.83K F 1/6W		
R29 ,30		⁎	RN14BK2E3R30FTS	RN 3.30 F 1/4W		
R43 -46			RD14AB2E100JTS	FL-PROOF RD 10 J 1/4W		
R47 -50		⁎	RS14DB3A101JTE	FL-PROOF RS 100 J 1W		
R67 ,68		⁎	RN14BK2C82R0FTS	RN 82.0 F 1/6W		
R69 ,70			RN14BK2C4752FTS	RN 47.5K F 1/6W		
R71 ,72		⁎	RN14BK2C3831FTS	RN 3.83K F 1/6W		
R93 ,94			RN14BK2C1003FTS	RN 100K F 1/6W		
R95 ,96			RN14BK2C3161FTS	RN 3.16K F 1/6W		
R121,122			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R123,124			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
R125,126		⁎	RD14AB2E122JTS	FL-PROOF RD 1.2K J 1/4W		
R127,128			RD14AB2E181JTS	FL-PROOF RD 180 J 1/4W		
R129,130			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R131,132			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
R151		⁎	RS14DB3A101JTE	FL-PROOF RS 100 J 1W		
D1 ,2			HZS5.1S(B2)	ZENER DIODE		
D1 ,2			RD5.1JS(B2)	ZENER DIODE		
D3 ,4			MA27W(A)	VARISTOR		
D9 ,10			HZS5.1S(B2)	ZENER DIODE		
D9 ,10			RD5.1JS(B2)	ZENER DIODE		
D11 ,12			1SS133	DIODE		
D11 ,12			1SS176	DIODE		
D13 ,14			MA27Q(A)	VARISTOR		
D15 -18			E-272	CONSTANT CURRENT DIODE		
D21			HZS5.1S(B2)	ZENER DIODE		
D21			RD5.1JS(B2)	ZENER DIODE		
D22			1SS133	DIODE		
D22			1SS176	DIODE		
D23			E-272	CONSTANT CURRENT DIODE		
D24			HZS16N(B2)	ZENER DIODE		
D24			RD16ES(B2)	ZENER DIODE		
D25			1SS133	DIODE		
D25			1SS176	DIODE		
IC1 ,2			NE5532P	IC(OP AMP X2)		
IC1 ,2		⁎	NJM5532D-D	IC(OP AMP X2)		
IC3			UPD4027BC	IC(JK FLIP-FLOP X2)		
Q1 -4		⁎	2SD786(R,S)	TRANSISTOR		
Q5 -10			2SC2320(E,F)	TRANSISTOR		
Q5 -10			2SC945(A)(Q,P)	TRANSISTOR		
Q11 ,12			2SC2003(L,K)	TRANSISTOR		
Q13 ,14			2SA954(L,K)	TRANSISTOR		
Q15 -18		⁎	2SK369(BL,V)	FET		
Q15 -18		⁎	2SK371(BL,V)	FET		
Q19 -24			2SC2320(E,F)	TRANSISTOR		
Q19 -24			2SC945(A)(Q,P)	TRANSISTOR		
Q25 ,26			UPA68H(K,L)	DUAL FET		
Q27 -30			2SC2320(E,F)	TRANSISTOR		
Q27 -30			2SC945(A)(Q,P)	TRANSISTOR		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti-nation 仕向	Re-marks 備考
Q31 -34			2SA733(A)(Q,P)	TRANSISTOR		
Q31 -34			2SA999(E,F)	TRANSISTOR		
Q35 -42			2SC2632(Q,R,S)	TRANSISTOR		
Q43 ,44			2SA1124(Q,R,S)	TRANSISTOR		
Q45 -47			2SC2320(E,F)	TRANSISTOR		
Q45 -47			2SC945(A)(Q,P)	TRANSISTOR		
Q48			2SA733(A)(Q,P)	TRANSISTOR		
Q48			2SA999(E,F)	TRANSISTOR		
Q49			2SA954(L,K)	TRANSISTOR		
CONTROL UNIT (X11-2350-81)						
D5	3B		B30-0431-05	LED(LN21CPH) POWER INDICATOR		
D6 -8	3B		B30-1010-05	LED(SLP-281F-50U)TAPE SEL		
D9 -15	3B,3C		B30-0431-05	LED(LN21CPH) INPUT SEL,MM,MC		
D16	3B	⁎	B30-1178-05	LED (VOLUME)		
D17	3C		B30-0431-05	LED(LN21CPH) MUTING		
D18	3C		B30-0432-05	LED(LN31GCPH(U)LINE STRAIGHT		
D22	3C		B30-0431-05	LED(LN21CPH) LOCK		
D23	3C		B30-0432-05	LED(LN31GCPH(U))		
PL1 ,2	3C		B30-1025-05	LAMP(14V 0.08A)DIG,INTERFACE		
C1 -20			C91-0747-05	CERAMIC 150PF K		
C21 ,22			C91-0753-05	CHIP C 470PF K		
C23 ,24			CF92FV1H224J	MF 0.22UF J		
C25 ,26			CC45FSL1H101J	CERAMIC 100PF J		
C27 ,28			CF92FV1H333J	MF 0.033UF J		
C29 ,30			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C31 -34			CC45FSL1H101J	CERAMIC 100PF J		
C35 -38			CF92FV1H684J	MF 0.68UF J		
C39 -42			CE04KW1C220M	ELECTRO 22UF 16WV		
C43 -46			CF92FV1H334J	MF 0.33UF J		
C47 -50			CF92FV1H393J	MF 0.039UF J		
C51 ,52			CC45FSL1H221J	CERAMIC 220PF J		
C53 ,54			CF92FV1H393J	MF 0.039UF J		
C55 ,56			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C57 ,58			CK45FB1H102K	CERAMIC 1000PF K		
C59 ,60			CF92FV1H334J	MF 0.33UF J		
C61 -64			CF92FV1H104J	MF 0.10UF J		
C65 -68			CK45FF1H472Z	CERAMIC 4700PF Z		
C69 ,70			C90-1335-05	NP-ELEC 4.7UF 50WV		
C71 ,72			CE04KW1E470M	ELECTRO 47UF 25WV		
C74			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C75 ,76			CC45FSL1H101J	CERAMIC 100PF J		
86	2B		E23-0149-05	TERMINAL		
E1	2D		E13-0628-05	PHONO JACK(6P) LINE IN		
E2 ,3	2D		E13-0624-05	PHONO JACK(6P) TAPE		
E4	2A		E13-0233-05	PHONO JACK(2P) FRONT AUX		
E5	1D		E20-0824-05	SCREW TERMINAL BOARD(8P)SPKRS		
E6	1D	⁎	E13-0240-05	PHONO JACK D/A DIRECT OUT		
-			J61-0307-05	WIRE BAND		
L1 ,2			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
L3 ,4			L39-0080-15	PHASE-COMPENSATION COIL		
R3 ,4			RN14BK2C3160FTS	RN 316.0 F 1/6W		
R37 ,38			RD14AB2E330JTS	FL-PROOF RD 33 J 1/4W		

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R39 ,40			RS14DB3A100JTE	FL-PROOF RS 10 J 1W		
R41 ,42			RS14DB3D180JTE	FL-PROOF RS 18 J 2W		
R43 ,44			RS14DB3D561JTE	FL-PROOF RS 560 J 2W		
R53			RD14AB2E102JTS	FL-PROOF RD 1.0K J 1/4W		
R55			RS14DB3D222JTE	FL-PROOF RS 2.2K J 2W		
R56			RS14DB3D472JTE	FL-PROOF RS 4.7K J 2W		
R57			RS14DB3D222JTE	FL-PROOF RS 2.2K J 2W		
R59			RS14DB3D561JTE	FL-PROOF RS 560 J 2W		
VR1	2B		R06-5143-05	POTENTIOMETER(200K)BALANCE		
VR2	3C		R10-5023-05	POTENTIOMETER (VOLUME CONTROL		
VR3	3C		R06-5154-05	POTENTIOMETER(100KAX2)LEVEL		
VR4	3B		R06-2017-05	POTENTIOMETER(5KBX2) TREBLE		
VR5	3B		R06-2016-05	POTENTIOMETER(5KBX2) BASS		
K1 ,2			S51-2045-05	MAGNETIC RELAY		
K3			S51-2074-05	MAGNETIC RELAY		
S1	3B		S42-3093-05	MULTIPLE PUSH SWITCH(TAPE SEL		
S2	3B,3C		S42-5045-05	MULTIPLE PUSH SWITCH(MONI,ETC		
S3	3C	*	S42-2145-05	MULTIPLE PUSH SWITCH(MUTE,LINE		
S4	3C		S40-4062-05	PUSH SWITCH (DIGITAL DIRECT		
S5	3C		S40-2200-05	PUSH SWITCH (AUX)		
S6	3B,3C		S42-2109-05	MULTIPLE PUSH SWITCH(MO,SUBS)		
S7	3C		S40-2200-05	PUSH SWITCH (LOUDNESS)		
S9	3B		S42-2137-05	MULTIPLE PUSH SWITCH		
S10	1D		S90-0078-05	SLIDE SWITCH (DUAL REC OUT)		
S11	1D		S90-0062-05	SLIDE SWITCH (SPEAKERS)		
D1 -3			HZS13N(B2)	ZENER DIODE		
D1 -3			RD13ES(B2)	ZENER DIODE		
D4			1SS131	DIODE		
D4			1SS178	DIODE		
D19 -21			1SS131	DIODE		
D19 -21			1SS178	DIODE		
D24 -26			1SS131	DIODE		
D24 -26			1SS178	DIODE		
IC1			NJM2041D-D	IC(OP AMP X2)		
Q1			2SC1845(F,E)	TRANSISTOR		
Q2 ,3			2SC2320(E,F)	TRANSISTOR		
Q2 ,3			2SC945(A)(Q,P)	TRANSISTOR		
Q4			2SC2167(O,Y)	TRANSISTOR		
Q4			2SD1266(Q,P)	TRANSISTOR		

COMPOUND ASS'Y UNIT (X90-2262-71)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti- nation 仕向	Re- marks 備考
C1			CK45B1H122K	CERAMIC 1200PF K		
102	2C	*	F09-0064-05	FAN		
107	2C,3C		J19-2598-05	HOLDER		
-			J61-0033-05	WIRE BAND		
110	2C	*	N19-1077-05	FLAT WASHER		
111	2C		N10-2040-46	HEXAGON NUT (M4)		
112	2C		N16-0040-46	SPRING WASHER		
K	2C	*	N09-1793-05	MACHINE SCREW (FAN)		
M	2C	*	N09-1790-05	MACHINE SCREW		
N	2D		N29-0067-05	PUSH RIVET (3.5X4.5)		
116	2C	*	S59-1080-05	THERMAL SWITCH		

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PROCESSOR UNIT (X32-1112-71)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Desti- nation 仕向	Re- marks 備考
D1 -3	3C		B30-0431-05	LED(LN21CPH) DIGITAL SELECTOR		
C1 ,2			CQ09FS1H151JZS	POLYSTY 150PF J		
C3 ,4		*	CQ93HP2A332GMA	MYLAR 3300PF G		
C5 ,6		*	CQ93HP2A122GMA	MYLAR 1200PF G		
C7 ,8			C91-0168-05	POLYSTY 68PF K		
C9 ,10		*	CQ93HP2A122GMA	MYLAR 1200PF G		
C11 ,12		*	CQ93HP2A472GMA	MYLAR 4700PF G		
C13 ,14			C91-0168-05	POLYSTY 68PF K		
C15 ,16		*	CQ93HP2A472GMA	MYLAR 4700PF G		
C17 ,18		*	CQ93HP2A562GMA	MYLAR 5600PF G		
C19 ,20			C91-0175-05	POLYSTY 56PF K		
C21 ,22		*	CQ93HP2A562GMA	MYLAR 5600PF G		
C23 ,24		*	CQ93HP2A332GMA	MYLAR 3300PF G		
C25 ,26			CE04KW1A471MEL	ELECTRO 470UF 10WV		
C27 ,28			CQ09FS1H101JZS	POLYSTY 100PF J		
C29 ,30			C91-0175-05	POLYSTY 56PF K		
C31 ,32			C91-0174-05	POLYSTY 47PF K		
C33 ,34		*	CQ93HP2A472GMA	MYLAR 4700PF G		
C35 ,36			C90-1353-05	NP-ELEC 10UF 25WV		
C37 -44		*	CE04KW0J471MEL	ELECTRO 470UF 6.3WV		
C45 -48			CE04KW1H010MEL	ELECTRO 1.0UF 50WV		
C71 -73			CF92FV1H103J	MF 0.010UF J		
C74 -76		*	CE04JW1E330MEL	ELECTRO 33UF 25WV		
C77 -80		*	CE04JW1V100MEL	ELECTRO 10UF 35WV		
C81		*	CE04JW1A101MEL	ELECTRO 100UF 10WV		
C82		*	C91-0735-05	CERAMIC 39PF J		
C83		*	C91-0927-05	POLYSTY 56PF G		
C84			CQ09FS1H681JZS	POLYSTY 680PF J		
C85		*	CE04DW0J331MEL	ELECTRO 330UF 6.3WV		
C86		*	CE04JW1A101MEL	ELECTRO 100UF 10WV		
C87			CC45FSL1H220J	CERAMIC 22PF J		
C88			CC45FSL1H101J	CERAMIC 100PF J		
C89			CF92FV1H474J	MF 0.47UF J		
C90			CF92FV1H473J	MF 0.047UF J		
C91			CC45FSL1H270J	CERAMIC 27PF J		
C92			CF92FV1H103J	MF 0.010UF J		
C93		*	C91-0735-05	CERAMIC 39PF J		
C94			CF92FV1H104J	MF 0.10UF J		
C98			CF92FV1H224J	MF 0.22UF J		
C99			CF92FV1H103J	MF 0.010UF J		
C100			CE04KW1A470MEL	ELECTRO 47UF 10WV		
C101		*	CE04KW0J102MEL	ELECTRO 1000UF 6.3WV		
C102-110		*	CE04JW1V100MEL	ELECTRO 10UF 35WV		
C111			C91-0769-05	CERAMIC 0.01UF M		
C113			C91-0769-05	CERAMIC 0.01UF M		
C115,116			C91-0769-05	CERAMIC 0.01UF M		
C117,118			CE04KW1A101MEL	ELECTRO 100UF 10WV		
C119,120			C91-0769-05	CERAMIC 0.01UF M		
C121,122		*	CE04KW1C470MEL	ELECTRO 47UF 16WV		
C123,124		*	CE04KW1C331MEL	ELECTRO 330UF 16WV		
C125-128			CF92FV1H103J	MF 0.010UF J		
C129			C90-1335-05	NP-ELEC 4.7UF 50WV		

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C130			CE04KW1A101MEL	ELECTRO 100UF 10WV		
C131-134			CE04KW1E222MEL	ELECTRO 2200UF 25WV		
C135			CE04KW1A101MEL	ELECTRO 100UF 10WV		
C136,137			CE04KW1H010MEL	ELECTRO 1.0UF 50WV		
C138,139		*	CE04KW1C332MEL	ELECTRO 3300UF 16WV		
C140			CE04KW1C101MEL	ELECTRO 100UF 16WV		
C141			CE04KW1V100MEL	ELECTRO 10UF 35WV		
C142,143		*	CE04KW1C332MEL	ELECTRO 3300UF 16WV		
C144,145		*	CE04KW0J222MEL	ELECTRO 2200UF 6.3WV		
C146-150			CK45FF1H103Z	CERAMIC 0.010UF Z		
C151,152			CE04KW1E101MEL	ELECTRO 100UF 25WV		
C153			C91-0757-05	CERAMIC 0.001UF K		
C154			C91-0757-05	CERAMIC 0.001UF K		
C155			CK45FF1H103Z	CERAMIC 0.010UF Z		
E1	1C	*	E13-0129-05	PHONO JACK(1P) REC		
E2	1C	*	E13-0239-05	PHONO JACK(1P) DIGITAL INPUT		
L1		*	L40-4701-14	SMALL FIXED INDUCTOR(47UH,K)		
L2			L92-0018-05	FERRITE CORE		
L3			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
L4 ,5			L40-1021-11	SMALL FIXED INDUCTOR(1.0MH,K)		
L6 ,7			L40-1021-14	SMALL FIXED INDUCTOR(1.0MH,K)		
L8			L39-0142-05	MATCHING COIL		
R1 ,2		*	RN14BK2C3161FTS	RN 3.16K F 1/6W		
R3 ,4			RN14BK2C1621FTS	RN 1.62K F 1/6W		
R5 ,6		*	RN14BK2C1003FTS	RN 100K F 1/6W		
R7 ,8		*	RN14BK2C4991FTS	RN 4.99K F 1/6W		
R9 ,10			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R11 ,12		*	RN14BK2C3831FTS	RN 3.83K F 1/6W		
R13 ,14			RN14BK2C3481FTS	RN 3.48K F 1/6W		
R15 ,16			RN14BK2C1621FTS	RN 1.62K F 1/6W		
R17 ,18			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R19 ,20			RN14BK2C9090FTS	RN 909.0 F 1/6W		
R21 ,22		*	RN14BK2C3161FTS	RN 3.16K F 1/6W		
R23 ,24			RN14BK2C9090FTS	RN 909.0 F 1/6W		
R25 ,26			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R27 ,28		*	RN14BK2C5620FTS	RN 562.0 F 1/6W		
R29 ,30		*	RN14BK2C1003FTS	RN 100K F 1/6W		
R31 ,32			RN14BK2C1621FTS	RN 1.62K F 1/6W		
R33 ,34		*	RN14BK2C3161FTS	RN 3.16K F 1/6W		
R37 ,38		*	RN14BK2C1002FTS	RN 10.0K F 1/6W		
R41 ,42		*	RN14BK2C9092FTS	RN 90.9K F 1/6W		
R43 ,44			RN14BK2C9090FTS	RN 909.0 F 1/6W		
R45 ,46		*	RN14BK2C1002FTS	RN 10.0K F 1/6W		
R47 ,48		*	RN14BK2C5622FTS	RN 56.2K F 1/6W		
R49 ,50		*	RN14BK2C1000FTS	RN 100.0 F 1/6W		
R98		*	RN14BK2C1962FTS	RN 19.6K F 1/6W		
R99		*	RN14BK2C1003FTS	RN 100K F 1/6W		
R100			RN14BK2C7501FTS	RN 7.50K F 1/6W		
R101		*	RN14BK2C4322FTS	RN 43.2K F 1/6W		
R130			RD14GB2E101JTS	FL-PROOF RD 100 J 1/4W		
VR1 ,2		*	R12-1409-05	TRIMMING POT. (LEVEL ADJ)		
K1 ,2			S51-2074-05	MAGNETIC RELAY		
S1	3C	*	S42-3104-05	MULTIPLE PUSH SWITCH(DIGITAL		

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D4 -11			1SS133	DIODE		
D4 -11			1SS176	DIODE		
D14		*	1SS237(1)	DIODE		
D15 -23			1SS133	DIODE		
D15 -23			1SS176	DIODE		
D24			E-272	CONSTANT CURRENT DIODE		
D25 ,26			HZS5.1S(B2)	ZENER DIODE		
D25 ,26			RD5.1JS(B2)	ZENER DIODE		
D27 -35			DSM1A1	DIODE		
D36 -40			1SS133	DIODE		
D36 -40			1SS176	DIODE		
D41			MA156	DIODE		
IC1 ,2			PCM56P-K	IC(DA CONVERTER)		
IC3 -10			NE5532P	IC(OP AMP X2)		
IC21		*	TC74HCU04F	IC(HEX INVERTER)		
IC22,23		*	TC74HC00F	IC(QUAD 2-INPUT NAND GATE)		
IC24			TC74HC04F	IC(HEX INVERTER)		
IC25		*	TC74HC386P	IC(EXCLUSIVE OR GATE)		
IC26		*	TC74HC123P	IC(DULAL MONO MULTI)		
IC27		*	MC4044P	IC(PHASE-FREQ DETECTOR)		
IC28		*	SN74LS624N	IC(VCO)		
IC29			TC74HC74P	IC(D-FLIP FLOP)		
IC30			TC74HC393P	IC(DUAL BINARY COUNTER)		
IC31		*	TC74HC112P	IC(JK FLIP FLOP)		
IC32		*	TC74HC86P	IC(EXCLUSIVE OR GATE)		
IC33		*	TC74HC112P	IC(JK FLIP FLOP)		
IC34			TC74HC04P	IC(HEX INVERTER)		
IC37		*	NJM555D	IC(TIMER)		
IC39			TC74HC00P	IC(QUAD 2-INPUT NAND GATE)		
IC40			TC74HCU04P	IC(HEX INVERTER)		
IC41		*	SM5804B-T	IC(DIGITAL FILTER FOR CD)		
IC41		*	SM5804D-T	IC(DIGITAL FILTER)		
IC42		*	CXD1076P	IC(DIGITAL AUDIO DATA)		
IC43,44			TC74HCU04P	IC(HEX INVERTER)		
IC45			UPC78L05	IC(VOLTAGE REGULATOR/ +5V)		
IC46		*	NJM79L05A	IC(VOLTAGE REGULATOR/ +5V)		
IC47			AN7805F	IC(VOLTAGE REGULATOR/ +15V)		
IC48			AN7905F	IC(VOLTAGE REGULATOR/ -5V)		
IC49			M5220P	IC(OP AMP X2)		
Q1 ,2			2SA733(A)(Q,P)	TRANSISTOR		
Q1 ,2			2SA999(E,F)	TRANSISTOR		
Q3 ,4			2SC2320(E,F)	TRANSISTOR		
Q3 ,4			2SC945(A)(Q,P)	TRANSISTOR		
Q5 ,6			2SC2003(L,K)	TRANSISTOR		
Q7			2SD1266(Q,P)	TRANSISTOR		
Q8			2SB941(Q,P)	TRANSISTOR		
A1	1D	*	W02-0726-05	OPTIC RECEIVING MODULE		

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UE : AAFES(Europe) X: Australia

⚠ indicates safety critical components.

KA-3300D

SPECIFICATIONS

Power Output

150 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.004% total harmonic distortion

Maximum Continuous Power Output (DIN) 1 kHz at 4 ohms	220 W
Maximum Continuous Power Output (DIN) 1 kHz at 8 ohms	160 W
Maximum Continuous Power Output (IEC/NF) from 63 Hz to 12,500 Hz, 0.7% Total Harmonic Distortion at 8 ohms	160 W + 160 W
Dynamic Power	178 W per channel at 8 ohms 320 W per channel at 4 ohms 460 W per channel at 2 ohms

Total Harmonic Distortion
AUX input to SPEAKER output
(20 Hz ~ 20,000 Hz) : 0.004% at 150 W into 8 ohms
(20 Hz ~ 20,000 Hz) : 0.003% at 75 W into 8 ohms
PHONO input to SPEAKER output
(1 kHz) : 0.005% at 150 W with VOLUME −20 dB
Intermodulation Distortion (60 kHz:7 kHz = 4:1) : 0.003% at 150 W into 8 ohms
Damping Factor : 1,000 (50 Hz into 8 ohms)
Power Bandwidth : 5 Hz to 50 kHz at 0.04% T.H.D.
Frequency Response : 1 Hz to 150 kHz/+0 dB, −3 dB
Input Sensitivity/Impedance
PHONO (MM) : 2.5 mV/47 kohms
PHONO (MC) : 0.1 mV/100 ohms
TUNER/AUX/TAPE : 150 mV/47 kohms
Signal to Noise Ratio (IHF-A)
PHONO (MM) : 87 dB (2.5 mV)
PHONO (MC) : 76 dB (250 μV)
TUNER/AUX/TAPE : 110 dB
Signal to Noise Ratio Unweighted: 50 mW (DIN)
PHONO (MM) : 60 dB
PHONO (MC) : 60 dB
TAPE/AUX/TUNER : 63 dB
Channel Separation (at 1,000 Hz) (DIN)
PHONO (Terminated with 2.2 kohms) : 67 dB
AUX (Terminated with 47 kohms + 250 pF) : 58 dB
Phono Input Capacity (DIN)
(MM) : 250 pF
(MC) : 1,650 pF
Phono Maximum Input Level
(MM) : 210 mV, (RMS) T.H.D. 0.003% at 1 kHz
(MC) : 8 mV, (RMS) T.H.D. 0.003% at 1 kHz
Output Level/Impedance
TAPE REC : 150 mV/220 ohms
PRE OUT : 2 V/600 ohms
Phono Frequency Response : RIAA standardcurve ±0.2 dB (20 Hz to 20 kHz)
Tone Control
BASS (at 50 Hz) : ±10 dB
(at 100 Hz) : ±10 dB
TREBLE (at 10 kHz) : ±10 dB
(at 20 kHz) : ±10 dB
Loudness Control (at −30 dB Volume Level) : 0 ~ 8 dB at 100 Hz
Subsonic Filter (at −3 dB) : 6 dB/Oct. at 18 Hz

D/A converter section

Digital Inputs : Optical × 1: −15 ~ −28 dBm
Coaxial × 2: 0.5 Vp-p/75 ohms
Digital Output : Coaxial × 1: 0.5 Vp-p/75 ohms
Signal to Noise Ratio : More than 105 dB at 1 kHz
Total Harmonic Distortion : Less than 0.003% at 1 kHz
Channel Separation : More than 115 dB at 1 kHz

GENERAL

Power Consumption : 7.1 A (U.S.A. and Canada)
280 W (Other)
AC Outlet : Switched × 2 (100 W)
Unswitched × 1 (400 W) (Except European and U.K. Models)
Dimensions : W 440 mm (17-5/16")
H 170 mm (6-11/16")
D 420 mm (16-9/16")
Weight (Net) : 19.1 kg (42 lb)

(IHF'66)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui doncerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

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